DECEMBER 10, 1922

THE RUBBER AGE

VOL. XII. NO. 5

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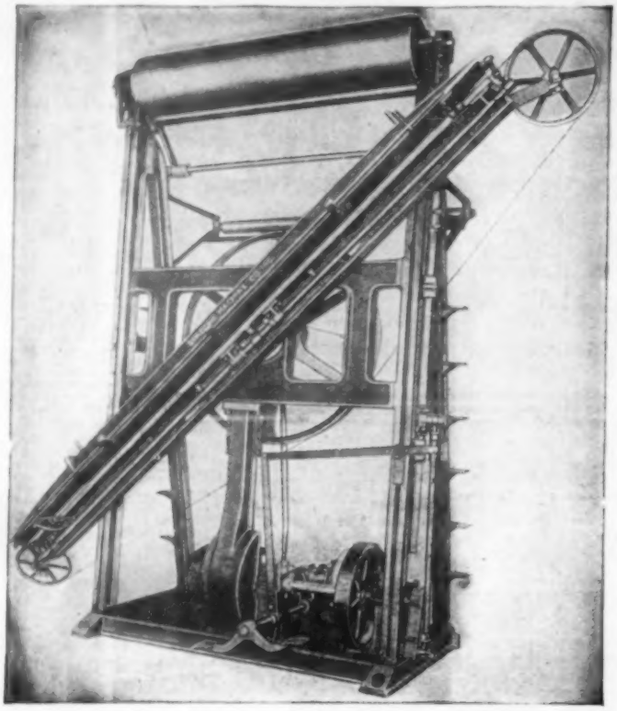

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THE
RUBBER AGE

VOL. XII. DECEMBER 10, 1922 No. 5

SCIENTIFIC MANAGEMENT FOR RUBBER MANUFACTURERS

Industrial Relations - XI.

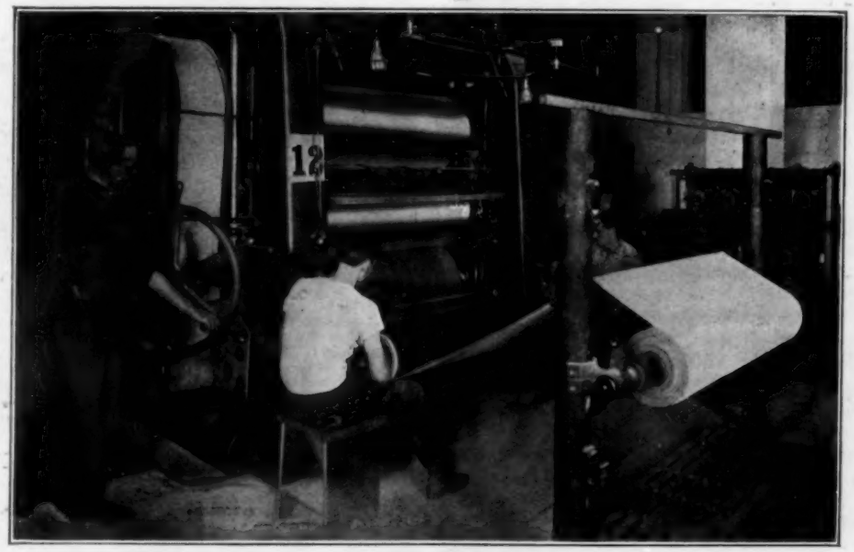
By Alfred Baruch

Consulting Industrial Engineer, New York

THE industrial development of the United States has brought with it certain problems which did not exist before. Conditions in this country made mass production necessary. This situation has been referred to elsewhere in this series but the true causes lie in other directions than those ascribed to them by people who have an interest in misleading the public.

Industrial enterprises in the United States have been driven to substitute machinery for manual labor because of the distinct labor shortage that has always existed in this country. The state of Texas is as large as all of Europe and yet Europe has two and a half times the population of the United States. It is clear that we never had enough labor to compete with Europe on an equal footing. The only alternative was the development of labor-saving machinery and this particular movement started long before we achieved any importance as a nation. Farm machinery was invented to make possible the cultivation of the vast stretches of agricultural land in the United States. When manufacturing became a necessity in this country business men were well prepared for the idea of using machinery where Europe used men.

The natural result of this wide use of labor-saving machinery and its consequent specialization of workers was that a great force of semi-skilled workers was developed. We never had any others to speak of. Such a thing as a skilled all-round mechanic is practically unknown here. The war proved that. When we attempted to machine airplane engine parts that required a great degree of mechanical skill and accuracy our spoilage records ran as high as eighty per cent.



TAKING CARE OF THE MACHINES IN A RUBBER FACTORY IS A SIMPLE MECHANICAL PROBLEM, BUT TAKING CARE OF THE MEN WHO OPERATE THE MACHINES IS A VERY COMPLEX HUMAN PROBLEM BESET WITH MANY DIFFICULTIES

The claim on the part of uninformed social workers and interested labor leaders that scientific management degrades labor and reduces it from a skilled to an unskilled state is absolutely unjustified and never has been justified. It is true that mass production degrades labor, but that is the only type of production possible in this country and the sooner the entire nation realizes that fact the better off we will be.

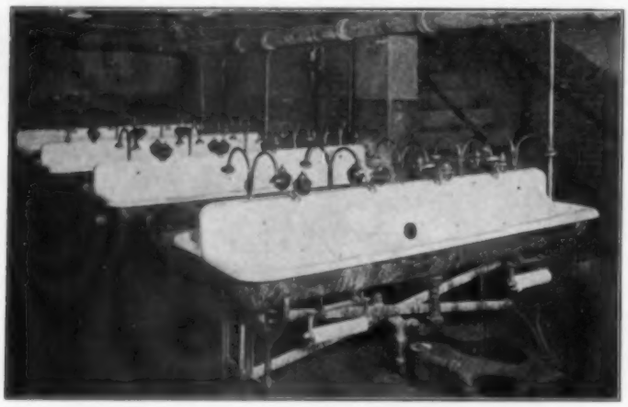
Apprenticeship Not the Solution

Take the rubber industry as an example. It is hardly conceivable that one man could start with the crude rubber and woven fabric and perform all the successive operations until he brings out a finished tire or transmission belt. Yet that is exactly what making a skilled out of a semi-skilled worker would mean. The same applies to practically all other industries. It is not desirable to develop skilled all-round mechanics of any sort and it is not possible even if it were wanted. Boys and young men in the United States are unwilling to devote the four or five years of intensive work that acquiring all-round skill necessitates. If you do not believe this, question any labor leader who has tried to start an apprenticeship system.

The solution for the evil effect of the systematic degradation of labor which attends specialization and mass production lies elsewhere. It can be found in shorter working hours, better conditions

of work, higher pay, and higher education. The substitution of machinery for men will keep pace with the growing shortage of semi-skilled and unskilled laborers. The varied classes that furnish this labor today will furnish tomorrow the engineers who will develop mechanical slaves to do man's work.

Industrial managers due either to higher altruism and foresight or to pressure exerted upon them by labor unions, social service bodies, and the government have already been taking steps in this direction. But in so doing many of them have overstepped the bounds beyond which a private enterprise could not go and have thus merited the criticism of labor leaders who claim that these efforts smack of paternalism. It is to the interest of society at large that workers become



SANITARY WASH BASIN EQUIPMENT IN A MODERN RUBBER FACTORY, SHOWING RUNNING WATER AND LIQUID SOAP ARRANGEMENT

more highly educated and that their capacity for creation as well as for the enjoyment of finer pleasures be increaesd, but that is society's task and should not be undertaken by any individual enterprise. If, after a private business has taken every precaution to see that its employees are not overstrained, that they are working under conditions which are conducive to health and happiness, that they are protected against both avoidable and unavoidable accidents and diseases incident to their occupations—if this business still feels that it has some money which should be invested in the welfare of its employees, it can very profitably give them a raise in wages. There never was a greater humbug than the belief that you spoil a man if you pay him too much.

The obligation of the employer has been stated above. He must secure conditions of work and living wages from society that will enable the worker to live comfortably if he wishes to stick to that one trade, or enable him to go higher and develop himself for a more responsible position if he wishes to utilize his spare time for that purpose. It is not the employer's task to furnish the worker with a higher education and to develop his emotional and aesthetic nature, nor is it the employer's task to make a better citizen out of the worker. This is society's job and the sooner the employer learns to leave it alone the sooner will society be forced to take up its duties in this direction.

However, there is still a wide field for the employer in his efforts to better industrial relations. When the plant was small the employer was in immediate touch with his workers, and if he was at all fair-minded he was in a position to minister to their needs and protect their interests. But with the natural growth of large industrial organizations in this country this task has become much more difficult. The employer multiplied his own productivity many times by delegating authority and responsibility to managers, superintendents and foremen. But by the same token he lost the personal contact with his employees and has had to resort to many substitutes. It is the purpose of this chapter to inquire systematically into the devices which conscientious and farsighted employers have utilized in re-establishing the conditions that personal contact made possible.

Industrial Education

The first of these has to do with education. Many industrial firms have undertaken to instruct and train their employees in the art of making their particular product. The expense of this training is now being borne by the employer while under the apprenticeship system as it still exists in Europe the expense is borne by the worker. The other activities on the part of the employer in the realm of welfare work have to do with creating proper working conditions, offering proper medical care, and attention providing for refreshment and recreation, instituting insurance, savings and loans associations, and finally installing what may generally be termed systems of industrial democracy in which the workers have a voice in the management.

Industrial education as practised by private enterprises today is of two kinds, general and specific. The general education has already been referred to. It covers subjects that one would ordinarily study in the public schools and has nothing to do with the process of manufacturing. The writer regards efforts in this direction no matter how well intentioned as an obligation foolishly assumed by the manufacturer at the expense of the buying public. The task of teaching individuals reading, writing, arithmetic and the higher developments of these subjects properly belongs to society and whenever a private business undertakes them it is assuming an unnecessary handicap in meeting competition or else it is taxing the public unjustly.

The specific education, however, has become a virtual necessity. The schools and colleges in spite of the criticisms that have been made of them by the so-called practical business man cannot in one class teach men to become master rubber workers, master mechanics, and railroad engineers. Besides, that is not the object of public schools. It is their business to teach the broader aspects of economics, sociology, ethics, etc. The task of making master rubber workers or even good tire builders falls on the rubber industry itself.

A great deal has been done in this direction. When a man is hired by one of the larger rubber companies he is assigned to an instructor who for several weeks coaches him in the art of tire making, tube building or whatever department he is assigned to. This training is given the worker at the company's expense. Most of the large companies pay the workers their minimum wage which represents their conception of a living wage. They also bear the expense of instruction and spoilage. The writer does not wish to imply that this action on their part springs from unselfish motives. These factories have to train their men in order to get a labor force. But the fact remains that these men are being taught a trade which is highly remunerative and that they are being paid for learning.

ARRANGEMENT OF INDIVIDUAL STEEL LOCKERS FOR WORKERS IN AN UP-TO-DATE RUBBER FACTORY

Most of the large companies have also found it necessary to train executives. In addition to the regular foreman's training school, the Goodyear Tire & Rubber Company has introduced the Flying Squadron which instructs young men with the proper education background in all the secrets of rubber product manufacturing. The primary object of this in-

struction is to develop a highly efficient organization which can be used in any part of the factory on short notice. It is an attempt to overcome the handicap of high labor turnover, with which the rubber industry is afflicted particularly in Akron. Whenever a department finds itself short-handed owing to an unusually large number of desertions or to some accident the Flying Squadron is called upon to fill the gap. The secondary object of this instruction is to develop foremen, superintendents and other executives. The men who are selected for the Squadron must have a college education or a creditable record as a rubber worker for some years. If he shows executive ability and initiative while in the Squadron, he is given the first foremanship that is vacant whether it is in the home factory or in any one of the branches being opened up all over the world. As a result of the implied honor in selection for the Squadron and the genuine value of the education given, positions on the Squadron are highly prized and this unit has developed an esprit de corps that hardly finds a parallel in any industrial organization.

Practically all of the bigger plants have special schools for salesmen. Some of the factories have worked out an arrangement with local schools and universities under which individuals may enter the plant on a part-time basis so that they may acquire practical as well as theoretical training in the course of their education. This develops a body of men who leave school ready to step into a job at the plant without further training. Noteworthy in this connection is the plan followed by the Goodyear company in bringing to Akron a whole colony of deaf mutes who are taught tire making and who develop into excellent workmen.

Working Conditions

The attitude of employers toward working hours is steadily changing for the better. It is estimated that nearly two million workers are on the eight hour day and the forty-four hour week. This is particularly true in states that are advanced in social legislation and industries where labor unions are very strong. However, there are some industries that have established an eight hour day without pressure from the outside and for this they are to be commended. This is especially true of the larger rubber factories.

There are still other causes for the change in attitude. Industrial engineers have demonstrated beyond the shadow of a doubt that a long working day does not mean the maximum output possible. Production records soon disclosed the fact that as the day advanced the worker slowed up perceptibly and after eight hours his output scarcely justified the expense involved in running the machines.

The definition of fatigue has been stated as "diminished capacity for work which is the result of previous work." Fatigue is really the poison that accumulates in the body as a result of the consumption of cell tissues. While the man is working this poison can hardly be expelled because the blood required to do it is needed by his arms, legs and head. Fatigue may be accentuated by poor lighting, poor ventilation, vibration, over-crowding, and unsanitary conditions. Exertion also contributes toward fatigue. Speed and monotony cannot very well be eliminated in the making of inner tubes. This condition can be relieved only by short working hours and frequent rest periods.

Among the other charges that may be made against fatigue as has been proved by scientific investigation are: first, the accidents—the statement that the great bulk of accidents takes place late in the afternoon or toward the end of the working shift hardly needs proof. Spoiled work, sickness, and lost time are also ascribable to industrial fatigue.

Innumerable experiments have been performed with workers operating on the short hour schedule. The Cleveland Hardware Company found that by maintaining the nine hour working day during the busy season they obtained just as good results as they ever had by working overtime. Later the day was reduced to eight hours and production increased. It was finally discovered that the men could do practically as much in six hours as they did formerly in eight but the eight hour day was retained at the workers' own request. The rubber factories themselves have discovered the value from the efficiency point of view in the eight hour day. This is especially true in an industry that operates largely on the basis of piece work where long hours mean less output and higher operating costs. For these same reasons overtime and Sunday work have fallen into general disfavor.

The solution of the problem from the point of view of both the employer and the employee seems to lie in shorter working hours. The employer will be able to take full advantage of the savings created by mass production and the employee will be able to enter wholeheartedly into the plans for specializing and simplifying his efforts because he will have more time to do just as he pleases. The writer frankly doubts the motives that prompt the efforts of skilled workers. Ninety per cent or more of labor works at the tasks assigned to it because it needs to earn a livelihood and not because it is guided by any love of the work. If people who are forced to work for a living spend six hours a day, performing some monotonous task at top speed so that they may earn their livelihood, they will be free to pursue their natural bent for the remaining eight hours of their waking day.

Prevention of Disease

In addition to shorter working hours the employer must provide for proper working conditions. All machinery must be guarded and the latest devices must be introduced for automatically stopping machines or cutting off current. The workroom must be well lighted and must be provided with clean washrooms within easy reach. Frankel and Fleischer in commenting on this subject state that many occupational diseases may be prevented by:

"(1) Securing the scientific ventilation of workrooms, especially by the installation of efficient local exhausts which remove dust at points of generation. In some industries such as in smelting and refining, fountain-pen point manufacturing, jewelry, etc., dust created is valuable and has been found profitable to recover the valuable material from the collected dust by means of a patented electrical precipitation process.

(2) Securing cleanliness by providing ample washing or bathing facilities. Some plants provide separate lockers for street clothing and working clothing, so arranged that the worker must remove his working clothes, hang them up to dry or place them in the lockers, and must then pass into the shower room before he can get to the locker containing street clothing. clothing.

(3) Wearing of proper protective clothing viz., respirators and goggles in dusty processes which cannot be taken care of by exhaust ventilation as in sand blasting and emery wheel grinding; boots and gloves in wet and chemical processes; special shoes for foundry working; helmets or welders; water cooled furnace doors for hot process workers; overalls, aprons, caps, etc.

(4) Shortening the working hours (and therefore, the period of exposure), allowing rest or "spell' periods in fatiguing and exhausting work.

(5) Requiring physical examinations at entrance, to weed out those unfit for work and to place others where they are best suited physically; and periodically to ascertain whether the workers are suffering from the effects of their occupations so that changes may be made and treatment or necessary advice given.

(6) Providing medical care including first aid and necessary subsequent treatment.

(7) Giving health instruction and safety education.

(8) Proper layout of plant and good housekeeping so that workers in one process are not unnecessarily exposed to the hazard of an adjoining process.

(9) Sanitation of plant to prevent the spreading of communicable diseases. This includes adequate and proper toilet facilities, sanitary and bubbling fountains, individual towels, spittoons, etc."

Recreation

In a large factory a lunchroom is absolutely necessary. The type of lunchrooms that are available to workers in the environs of a factory are not usually conducive to health and appetite. A lunchroom on the cafeteria style can usually provide good wholesome food at very moderate prices. Besides, this gives the management an opportunity to place the

noonday meal of their employees in the hands of dietitians who can select the food scientifically.

It has been found advisable to provide ample rest rooms for employees especially where large numbers of women work. This question must be treated in exactly the same way by the employer, as those of heating, lighting, and sanitation. Recreation facilities must also be provided. The custom is growing of offering means for dancing during the noon hour. Gymnasiums and athletic fields are popular and are a great help as a source of recreation for the workers. Both the Firestone and Goodyear companies have large well-equipped clubhouses in which the worker can find practically every form of amusement available anywhere else. However, it is possible to carry this form of expenditure so far that it becomes an actual strain on the business.

Workmen's compensation insurance and other forms such as un-employment and old age have been instituted by the management of some factories. In most cases only the required compulsory insurance is enforced, although mutual benefit associations are quite common. The benefits that can be derived from a plant insurance association are doubtful. Insurance is based on the laws of probability and in order for any such undertaking to be secured it will have to cover a great number of people—at least several hundred thousand. Safety in insurance requires that the risk shall be spread over as many people as possible. Furthermore, the calculation of the necessary rates and the administration of the reserves must be in the hands of experts, as this is an extremely complicated and highly technical field. It is doubtful whether insurance can be offered to a small group without a relatively high cost, both for protection and for administration. There are some forms of insurance such as old age pensions and accident liability which the employer can buy for the group. The unfortunate part of such a proceeding is the lack of uniformity in laws which expose a fair-minded employer to the competition of men who will take no such precautions for the safety and welfare of their employees unless they are compelled to by law.

Savings and Loans

Savings associations, however, are of great help to the workers. People earning comparatively low wages are quite likely to spend all they earn, even though the opportunity for saving exists. By having an arrangement whereby a weekly sum is deposited to the worker's credit in a reliable bank, it is possible to save a worker's money before he has time to spend it.

Another service which the factory can render the employee is to provide some means by which he can borrow small sums of money without having to resort to the pawnbroker. Still another activity in which the larger organizations have been engaged is to purchase a residential site conveniently near to the factory, and to throw it open to the workers for development. The money required for building up to as much as 80 per cent of the value of the house is advanced to the workers and they are free to pay it back by easy stages. This service, however, loses some of its force since it is well known that many factories use this scheme for binding the workers permanently to themselves, and once a man has invested his savings in a home, his salary advances do not begin to compare with his record before he so bound himself.

Industrial Democracy

In an effort to restore the contact between managers and the men many attempts have been made to introduce some system of representation in the management on the part of the workers. These have taken various forms. They have appeared as profit-sharing schemes or as systems of industrial development, as advocated by John Leitch. The most comprehensive attempt to introduce industrial democracy in a rubber factory is the Goodyear Representation Plan introduced at the Goodyear factory by P. W. Litchfield, its general manager. Mr. Litchfield made an exhaustive comparison between the various types of government, and finally came to the conclusion that the American system of direct representation and checks and balances, while leaving a good deal to be desired, has operated in the long run to the benefit of the greatest number of people, and it is to that extent superior to any other form of government. In seeking to find a means by which the workers may have a voice in the management without handicapping the efficiency of the plant, and without usurping the rights of the investors, Mr. Litchfield hit upon the plan of paralleling our federal government. The plan is described below:

"The great force at the Akron factory of the Goodyear Tire and Rubber Company, constantly increasing during the past few years until it has reached a number of 30,000 employees, made it very difficult for the management closely to follow the needs and desires of the men.

"A labor department, to cover the usual subjects of welfare of employees, had been established for several years, and had been performing its function as efficiently as possible, but still there was a feeling that many men did not avail themselves of this department to its fullest extent.

"It was felt that the best line of contact with the men would be to have them elect directly their own representatives to cooperate with the management.

"During April 1919 it was decided to form a Council of Industrial Relations composed of six factory executives, two men from the labor department, two men elected by the foremen, and six men elected from amongst the men themselves, to meet and try to formulate a plan of industrial representation. The factory was divided into precincts, and by Australian ballot the members of an electoral were elected, and these men in turn chose employees' representatives to the council of industrial relations.

"The first council, composed of sixteen men, met weekly to discuss the problem and also investigate what had been done by other companies and associations along this line. They finally agreed unanimously on an industrial representation plan for the Akron plant of the company. This plan provided as a basis of representation a form of citizenship in the industry, creating a class known as 'Industrialists,' or voting citizens of the factory, composed of employees who had reached the age of eighteen years, who understood the English language, were American citizens, and had been in the employment of the company continuously for six months or more. This industrial representation plan was submitted to a referendum vote of the industriants and also to the board of directors. It was approved by the industriants by Australian ballot, 92 per cent voting in favor of it. The board of directors were unanimous in their approval."

The following excerpt from the plan itself indicates the scope of power exercised by the Industrial Assembly;

"Every bill which shall have passed the House of Representatives and the Senate shall, before it becomes a factory rule or regulation, be presented to the Goodyear factory manager. If he approves he shall sign it, but if not, he shall return it with his objections to the house in which it shall have originated, who shall enter the objections at large upon their record, and proceed to reconsider it. If, after such reconsideration, two-thirds of that house shall agree to pass the bill, it shall be sent, together with the objections, to the other house, by which it shall likewise be reconsidered, and if approved by two-thirds of that house, it shall become a factory rule or regulation."

The chief effect of the plan to date has been to furnish the workers with a means for airing their grievances without taking it to their immediate superiors and thus avoiding the antagonism that a man who complains always arouses in his foreman. It has helped the management too in that it has taken out of the hands of the foreman and the superintendent the tasks which were not immediately concerned with production and which they were not trained to perform either by experience or education. The workers have been given a voice in the management and to that extent they are bettered. The writer recalls the incident in which a foreman was transferred to another department and nearly discharged because of complaints made to the Industrial Assembly.

It is doubtful if this body would ever be permitted to consider or to recommend general wage increases and similar questions of large importance. Its chief function is to adjust the minor difficulties and injustices that are bound to arise and which the owner would deal with fairly if the organization were small enough for them to come to his attention. Collective bargaining on a broad and intelligent basis seems to be the only solution for the major problems that arise out of industrial relations.

Market for Rubber Heels and Soles in South Africa

By U. S. Vice Consul Arthur H. Cawston, Cape Town

ALTHOUGH the market for rubber heels in South Africa is not so great in proportion as in the United States, the number sold is surprisingly large, despite the poor quality and the lack of advertising so prevalent here. It is the medium and poorer classes who wear rubber heels in South Africa. Dealers state that the colored people, who are very poor, are nevertheless good customers for rubber heels. The reason is that it costs less to put the cheapest grade of English rubber heels on a pair of shoes than it does to put on leather heels. Rubber heels are not worn extensively by the better class of people, as they have not been educated to their advantages.

The majority of rubber heels sold are of English manufacture, although there are a good number of locally made heels sold, which compare favorably with the English and are slightly lower in price. The only American heel at all well known here is a very inferior make. Apparently the more important American manufacturers of rubber heels have made no serious efforts to obtain business in this country. Undoubtedly there is a good market here for the best grade American heels, as it is admitted that they are much more resilient than the English heels and wear better. Most of the English heels sold here are made of such hard rubber that they are little better than leather heels. The South African heels are more resilient than the English, but do not wear so well.

Prices of American and English Heels

The prices quoted for American heels in South Africa are as low as, and in some cases lower than, the English. A large wholesaler of rubber heels in Cape Town quotes the best quality of shaped English rubber heels at $4 per dozen; it is not known what these cost the wholesaler, but it is probably at least $2.50. The Cape Town representative of one of the largest American rubber companies quotes the best grade of shaped heel made by his company at $2.40 per dozen, f.o.b. South Africa. Cheaper quality American shaped and round heels are priced at approximately the same as similar English heels.

The best-selling rubber heels in this country are medium-priced round heels, wholesaling at about $1.50 per dozen. Round heels sell better than shaped heels, because they are easier to put on. Cobblers do not take the same care in putting on a pair of rubber heels here that they do in the United States, consequently shaped heels are often put on very badly. There are English round heels on the market here which wholesale as low as $0.60 per dozen; others range in price up to $2 per dozen.

Greater Efforts Needed to Develop Market

Most of the South African boot and shoe manufacturers are located in Port Elizabeth. If these manufacturers could be induced to equip only a part of their boots and shoes with rubber heels, a large avenue of business would be opened up, as this is one of the leading manufacturing industries in South Africa. In 1919-20, the latest year for which figures are available, there were approximately 2,000,000 pairs of boots and shoes, valued at $6,000,000, manufactured in South Africa. One of the leading Cape Town importers of rubber heels estimates that 1 pair of shoes in every 10 is equipped with rubber heels. This, however, is probably too high even for the towns, and is certainly much too high for the country districts. But no matter what the number of rubber heels now sold, it seems evident from all information available that many more could be sold in the country if greater efforts were made, especially in the way of local advertising such as is done by manufacturers of rubber heels in the United States.

Fairly Good Demand for Rubber Soles

Rubber soles for ordinary leather shoes are fairly popular in South Africa. It is quite common for a person here to have his shoes resoled with rubber instead of with leather. Rubber soles cost no more than leather and are said to wear much longer. Virtually all the rubber soles on the market here are English or South African; there have been only a few American rubber soles in this country. Wholesale prices of the English product are 40 cents per pair and up; the South African makes run slightly less. The manufacturers of the English "Phillips" rubber heel sell a four-piece set for shoes, consisting of a rubber sole in three pieces and a rubber heel. According to dealers, these sets are selling well; they wholesale at $1 per set, and cobblers charge $1.75 for supplying the set and putting it on. The principal objection to rubber soles in this semitropical country is that they make the feet hot. American manufacturers of a rubber composition sole which obviates this objection could probably do some business in South Africa.

The import duty on rubber heels and rubber soles into the Union of South Africa is 20 per cent ad valorem.

Rubber Manufacturing Industry in Egypt

THE Société des Industries Egyptiennes, Sahel E. Ghelal, Boulac, Cairo, operates a factory for the manufacture of rubber goods. This factory started operations as a private concern about 11 years ago and in 1916 was reorganized as a limited liability company, being a subsidiary of the Banco di Roma of Rome, Italy. The capital is stated to be £E70,000. The company maintains agencies in Alexandria and Port Said, and imports raw rubber and other materials from England and Belgium, and a small quantity from France. Of late years the Sudan has been able to supply a small quantity of plantation rubber, there being 40 acres planted. The company sells mainly to the Egyptian Government departments, but also to private dealers; and in addition to selling wholesale, they accept retail orders.

The value of the output has been estimated at £E20,000 annually, and it is claimed that the products are successfully competing with foreign manufactured rubber goods. The factory employs about 100 laborers, of whom 15 are Europeans, the foreman being French. The company has a complete permanent exhibit at the Egyptian Industries Exhibition at Cairo.

The following articles are manufactured: Rubber sheets and plates, carved and molded; technical articles for industrial purposes; rubber hose and tubings; articles for hospitals and pharmacies; and tires, tubes, etc., for motor cars and cycles.

Venezuelan Market for Tires

IN Venezuela American-made tires are considered superior in quality to foreign makes and are able also to compete with them in price. About 75 per cent of the cars in the country use tires of the smaller inch clincher variety, 5 per cent are equipped with metric clinchers, and 20 per cent employ straight-side tires. The cord tire is very popular in Venezuela, tire dealers finding it difficult to sell fabric tires above the small inch clincher sizes; in fact, 90 per cent of the owners of cars taking the larger size tires employ cords, and 5 to 10 per cent of the small car market uses cords.

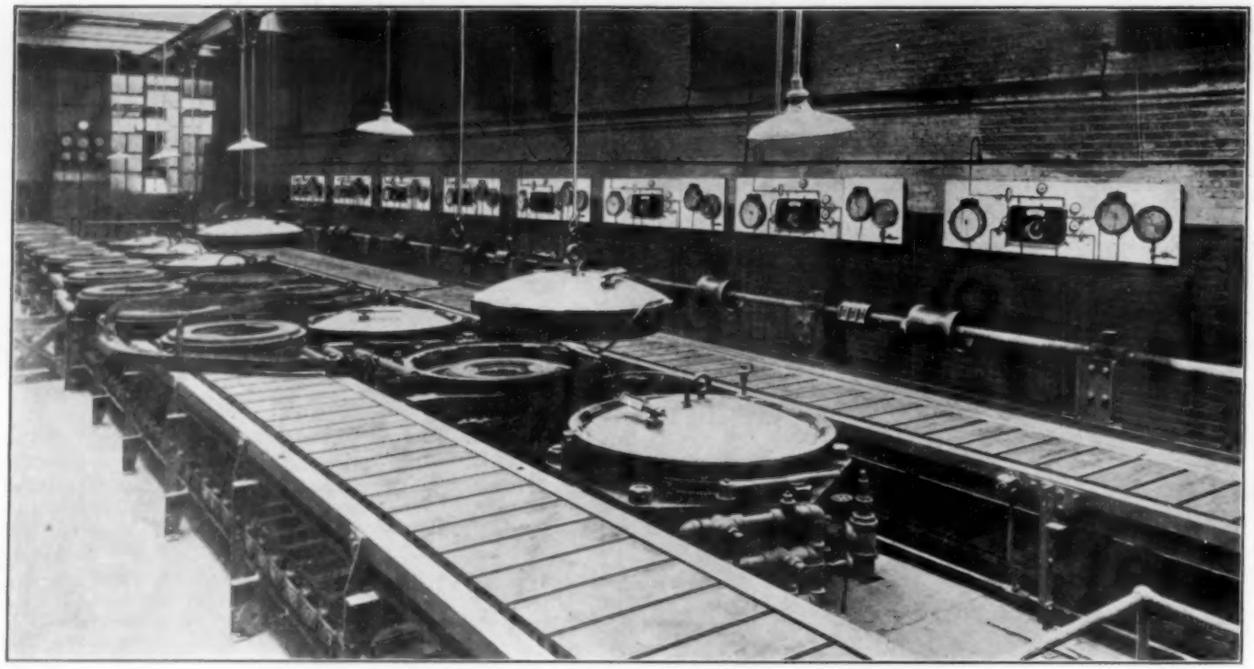
Sales are usually effected through local distributors, some of whom operate branch houses in the principal cities of Venezuela. The usual terms are payment by draft, 60 to 90 days' sight.

Owing to the poor condition of roads and streets, as well as to the hot climate, it is estimated generally that a car will consume on the average six tires per year.

Practically all of the heavier trucks are equipped with solid tires, though the percentage of pneumatic tires used on small trucks is increasing. There is a good demand in Venezuela for solid rubber tires for carriages; in Caracas the consumption is about 150 reels per year. Approximately 95 per cent of the carriage tires used is of a clincher variety that American manufacturers do not make, most of this material now coming from England.

Curing: Ten Years Ago and Today

The Engineer's Own Story Showing How Automatic Temperature and Pressure Control Apparatus Serves the Heater Room of the Rubber Factory Today Instead of the Old "Flip-a-Coin" Methods in Vogue a Few Years Back



A Modern Installation of Automatic Temperature Control

WELL I'll be! Bill Chance!" exploded MacGowan letting his feet drop off the desk which they had been occupying conjointly with a pile of recorder charts, a disassembled two-inch valve, and a litter of production reports.

"The kid himself," admitted Bill with his sunburned face cracked in a wide grin. "The kid himself fresh from Mangadore, Brazil. How's Mac?" They grasped each other's hands with real feeling.

"I guess it must be every bit of ten years since I saw you last, Bill," said MacGowan.

"Eleven," corrected Bill. "Remember they had just handed us both nice blue slips at Rumson Rubber when they went bust. We were kinder blue ourselves, Mac, weren't we? Then in two weeks I was sailing for the plantations."

"And I started in here," continued Mac. "You stayed right with that Delafield Para, Limited, outfit and now you're manager of their whole rubber ranch."

"And they told me at the gate that you're Supe over this layout."

That started them off on a half-hour of swapping experiences because these two old side-kicks had been out of touch since they had been heater-men together eleven years back. Interruption came when a foreman leaned in at the door.

"Shoot, Fred," said MacGowan.

"That press 66 is all hooked up with the new control outfit, ready for a heat in half an hour. You want to look her over?"

"Be with you in twenty minutes, Fred," said MacGowan; and then to Chance: "That gives me a little time to show you around the place—or did you stop off at some of the Eastern plants?"

"No," returned Bill, "I've been out of the picture so long, I don't know where any of the old bunch is. Fact is, I only found out where you were from the folks."

Illustrations Courtesy of C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

"Fine! Just come along with me and I'll show you how tires are made today, and believe me it's a whole lot different from the 'flip-a-coin' methods they were using when you nursed a hand-valve."

By the time they had reached the heater room Bill had exhausted all exclamations at the remarkable changes in rubber machinery and methods, but a few more surprises were in store for him. The first was the number of big tire presses; the second, the small number of men.

"Don't you have any heater men for these forty heaters?" he queried. "There used to be a man for every two heaters."

"Old stuff, Rip Van Winkle." laughed MacGowan. "Now we just have ten men on this floor. Four men on each side of the room work as a group in loading and unloading heaters. Then we have an instrument man on each side."

"Whatdya mean, 'instrument man'?" Bill wanted to know.

"Of course you wouldn't know about an instrument that admits steam automatically so that we get the vulcanizing temperature in the heater in an exact period of time and at the end of the cure automatically admits flooding water," said Mac, who was pretty glib on his pet hobby. "But you left just about the time when we were substituting mercury thermometers for steam pressure gages, didn't you? How we old-timers fought against the use of those thermos we thought we couldn't read. I'll admit I was one of them, but we soon learned that pressure didn't mean we had a corresponding temperature, on account of trapped air and wet steam, and the temperature really did the curing by acting on the compounds. Until we used thermometers we never knew the temperature. We thought we had ideal conditions when each heater was equipped with a reducing valve, pressure gage, and trap.

"After getting used to thermometers, temperature controllers soon replaced the old pressure reducing valves.

"Then came the Recorder because while curing by an indicating thermometer was good enough for the heater man,

the laboratory and production department wanted to know the reason for under and over cures. The recording thermo supplied this information.

"But our troubles weren't ended. We weren't getting the same temperature at the bottom of the heater as we were at the top. So we adopted a temperature controller which discharged wet or low temperature steam from the heaters, and this intermittent opening of the condensate line gives us a circulation that prevents air pockets from forming."

Exit—The Old Alarm Clocks

"Wait a minute, Mac," interrupted Bill. "What happened to the old alarm clocks that were stuck all around the room? And I miss the chalk marks on the heaters. You know, 'In 2:11—out 3:41'."

"Oh yes, we used a Time Controller for that at first. We would set the pointer on the clock face dial to the exact length of time required for the cure and without any further attention at the expiration of the cure, the steam was shut off and the steam discharged from the heater."

"But now we don't use separate units for control of temperature, condensate and time. Everything is all handled by the one controller. Take a look at one of these instruments.

"The instrument really consists of two separate temperature controller-units," said Mac, opening the case, thereby exposing the mechanism, "one regulating the steam-inlet, the other regulating the condensation outlet. The temperature setting-point of the condensation-outlet unit is adjusted a few degrees lower than the setting point of the steam-inlet unit. Then this clock-driven cam automatically changes the temperature setting points of both controller-units, at the same time, and an equal amount, in accordance with the temperature curve.

"This feature alone saves steam enough to repay for the investment—not in a year's time, but in a few months.

"You remember how we brought up the heat years ago? We would crack the steam valve and expect to get a temperature of 290° F. (oh, no, it was pounds pressure then) in thirty minutes. No matter how we juggled the hand-valve, we would reach the vulcanizing temperature either too soon or too late. Can you imagine how long a customer would ride on a shoe these days if we reached the vulcanizing temperature in 20 minutes instead of thirty?

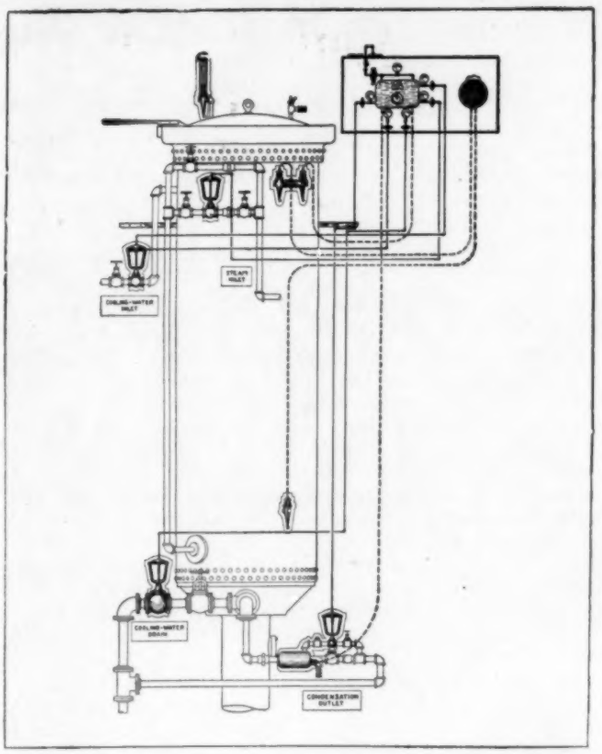
"Not on your life! It can't be done with the high-powered accelerators we use these days. The chemists figure that it takes just 30 minutes for every particle of the tire to reach the vulcanizing temperature. If we got to 290 in 20 minutes, we would be vulcanizing the outside of the shoe, while the inside would be under 260°. As soon as the outer particles had been started to vulcanize, it would be practically impossible for the heat to penetrate the interior.

"We've got four chemists now. They are constantly trying to improve our tires. One big job for the chemists is to select an accelerator that will shorten our cures without impairing the wearing qualities. They juggle the compound and then work out a time-temperature schedule for the cure." Mac was going strong now and could not stop.

An Instrument that Almost Thinks

"Just see what this cam will do for us," he continued with enthusiasm. "We have this adjustable riser that can be set to absolutely bring the temperature gradually to the vulcanizing point in a definite period of time. If the chemist changes his compound, instructions are given to the instrument man and he accordingly lengthens or shortens the time of rise. The instrument man also has full control over the time period. He can set this trip arm for the length of time he wishes to maintain the vulcanizing temperature. As the clock revolves the cam moves with it and, at the end of the cure, these two followers come in contact with the trip arm. The followers trip and that automatically shuts off the steam inlet valve, blows off the steam in the heater, and admits flooding or cooling water.

"We got so used to automatic control that we asked the instrument makers to give us control over the admission and discharge of the cooling water. Up to this time it was still necessary for the heater man to expect the ringing of a bell, or the lighting of a lamp, to indicate that the cure was up



AUTOMATIC CONTROLLER WHICH REGULATES THE ADMISSION OF COOLING WATER IN CONJUNCTION WITH THE CONTROL OF TEMPERATURE, CONDENSATION, AND TIME

and that he had to hustle to the heater to open his water valve. So they doped out two new instruments, so arranged that at the end of the cure, the cooling water valve is operated automatically and admits cooling water for a certain length of time. Of course, we can adjust this time period; make it anywhere from one to ten minutes. We can also adjust the time for which the discharge valve will be open; this adjustment is also from one to ten minutes.

"One thing more they did. As a precautionary measure, these controllers have a special feature which is necessary if we can't always be sure of our water pressure. In other words, if we did not first blow-off the steam at the expiration of the cure, if our water pressure would be below the pressure of the steam in the vulcanizer, steam would have to dissipate itself before the water could enter. In that case, we wouldn't have definite control over the time period and the chances of an over-cure would be quite probable. So, in these two controllers they added a feature which takes care of the time required for blowing off the steam before the cooling water is admitted."

Mac stopped for breath. "Now," he said, looking at his watch, "come along with me and we'll see one of these new ones work."

Year Book of I.R.I.

THE RUBBER AGE is in receipt of a copy of the First Year Book of the Institution of Rubber Industry (The Rubber Club of Great Britain), Charing Cross House, Charing Cross Road, London, W.C.2, through the courtesy of W. F. V. Cox, secretary. It is a comprehensive volume of 290 pages consisting for the most part of twelve technical papers and discussions which were reported at various meetings of the institution in the fall of 1921 and the spring of this year. There is also a list of officers and members of the general council, committee members, description of the organization's objects, a list of members and donations, program for 1922-1923, and other useful material. There are thirty-one pages of advertising at the back of the book.

Chemistry of Rubber Vulcanization and Acceleration

Zinc Oxide the Most Important Accelerator, but Others Are Being Studied and New Developments Are Anticipated

By C. W. Bedford

Research Laboratories, The B. F. Goodrich Co., Akron, Ohio

IT is now generally conceded that the vulcanization of rubber is a chemical process, while physical chemistry plays a secondary, although important part. The addition of sulphur to rubber has long been recognized as greatly facilitated by the presence of inorganic accelerators such as litharge, lime or white lead, the latter having been first used by Charles Goodyear himself, but only within the past few years has it been shown that these inorganic accelerators are dependent on the presence of resins, proteins, organic accelerators or other organic substances, and that their action is secondary in character. While the accelerating action of ammonia had been observed in 1881,[1] it was not until 1906 that the organic nitrogenous accelerator was discovered. Since the publication of the Bayer patents on piperidine in 1912 the number of known organic accelerators has increased into the hundreds.

The mechanism of the vulcanization process is each year becoming more fully understood through the efforts of rubber chemists the world over. The following is a brief summary of the results of their latest work.

The relative reactivity of different forms of sulphur is a fundamental question which has recently been investigated further by D. F. Twiss.[2] His work indicates that there is little difference in activity between soluble and insoluble sulphur at temperatures from 68° to 188° C. The Peachey process of vulcanization by hydrogen sulphide and sulphur dioxide[3] gases at ordinary temperatures liberates a form of sulphur which may be isolated[4] and used for vulcanizing rubber at low temperatures. This form of sulphur quickly changes through the insoluble or plastic variety to ordinary rhombic sulphur, thereby losing its extraordinary vulcanizing power. The question of "nascent" sulphur and its possible reaction with rubber is still an open one. Peachey has relied on this explanation for his cold vulcanization by gases. Others have called attention to the inactivity of nascent sulphur liberated in rubber cements by the action of hydrogen sulphide on aromatic nitroso compounds.[4] This question is of great importance for the ultimate explanation of the mechanism of vulcanization.

Vulcanization by organic disulphides without the use of elemental sulphur has recently been reported from several sources. Romani[5] cites tetramethyl thiuram disulphide and Caldwell[6] mentions oxybutyl thiocarbonic disulphide (butyl xanthic disulphide). The disulphides are said to revert to monosulphides, giving up the other atom of sulphur to the rubber. Bloch[7] had previously vulcanized rubber with hydrogen disulphide, and Kratz[8] used ammonium hydrosulphide without free sulphur but in the presence of air (ammonium disulphide). Vulcanization with disulphides seems to be related to the vulcanization without sulphur by benzoyl and other peroxides, according to Ostromuislenskii.[9]

Closely related to the action of disulphides is the action of higher polysulphides. The use of antimony persulphides is well known. Gerard vulcanized with zinc[10] and calcium polysulphides,[10] Bourquin[11] used the polysulphides of hydrogen, sodium, and calcium, Esch[12] worked with magnesium polysulphide, and C. O. Weber[13] states that zinc sulphide has some vulcanizing action. Erdmann,[14] in 1908, proposed a polysulphide theory of vulcanization through the formation of thiozonides, a theory that was later expanded by Ostromuislenskii,[15] Kratz,[16] Bedford,[17] Bruni,[18] and their co-workers. Organic polysulphides of meta-toluylene, diamine disulphide, mercaptobenzothiazole disulphide, and other disulphides are also used for vulcanization purposes. Their action, however, is greatly aided by the presence of zinc oxide.

A further advance in rubber chemistry was made by Ostromuislenskii[19] by the discovery of the rapid vulcanization of rubber at ordinary temperatures. The dithiocarbamates of piperidine, methyl amines and many other organic bases cause sulphur to vulcanize rubber at room temperatures in a comparatively short time. Later it was shown that this vulcanizing power is available only in the presence of metallic oxides and that metallic salts of dithiocarbamates function in the process of vulcanization. Ostromuislenskii[20] also found that zinc alkyl xanthates are equally strong in their accelerating power although they contain no nitrogen, an element which for many years was considered necessary for vulcanization. Zinc thiophenols[21] have also been added to the list of nonnitrogenous accelerators.

Most organic accelerators rely on the secondary action of metallic oxides to bring out their full vulcanizing power, while some, such as aniline and aldehyde ammonia, are retarded thereby. Scott and Bedford[17] have divided organic accelerators into two classes: (*a*) hydrogen sulphide polysulphide accelerators, (*b*) carbosulphydryl polysulphide accelerators. The first class includes compounds such as aniline which do not need the aid of inorganic accelerators, and are supposed to form polysulphides by first reacting with hydrogen sulphide to form derivatives of ammonium sulphide, then dissolving sulphur to form polysulphides similar to ammonium polysulphide. The second class either contains carbosulphydryl groups or forms them by reactions during vulcanization. This class includes mercaptans, dithiocarbamates, thioureas, xanthates, etc., and is said to function through the formation of the metallic salts which are described as forming mercaptide polysulphides that contain per-sulphur sufficiently active to react with rubber at ordinary temperatures. In support of this general theory there has been prepared an active type of zinc sulphide[4] which forms polysulphides and is an active accelerator. Thiocarbanilide is comparatively inactive in the absence of zinc oxide and has been found to form zinc and lead mercaptides through its tautomeric mercapto form.

Twiss[22] energetically disagrees with this theory of the action of zinc mercaptides, dithiocarbamates, xanthates, etc., calling attention to the fact that the zinc salts still need the presence of zinc oxide to bring out their full vulcanizing power. Bedford and Sebrell[23] found that their action was also increased, in rubber cements, by the presence of aniline, and Cadwell[6] [22] finds the same action of aniline and other amines, not only on zinc dithiocarbamates, xanthates, etc., but also on thiuram disulphides and xanthic disulphides:

[1] Brit. Patent 787 (1881).
[2] *J. Soc. Chem. Ind.*, 40 (1921), 48T.
[3] Brit. Patent 129,826 (1919).
[4] THIS JOURNAL, 14 (1922), 25.
[5] *C. A.*, 16 (1922), 854.
[6] Brit. Patent Application 174,915 (1922).
[7] Ger. Patent 219,525 (1908); *C. A.*, 4 (1910), 2211.
[8] THIS JOURNAL, 13 (1921), 67.
[9] U. S. Patent 1,249,181 (1917).
[10] Gmelin, "Handbook of Chemistry," 17, 349.
[11] *Gummi-Markt.*, 4 (1910), 408.
[12] *Ibid.*, 9, 68 and 125.
[13] *Z. angew. Chem.*, 1893, 631, 661.
[14] *Ann.*, 362 (1908), 133.
[15] *C. A.*, 10 (1916), 1944, 3177.
[16] THIS JOURNAL, 12 (1920), 317.
[17] *Ibid.*, 13 (1921), 125.
[18] *C. A.*, 15 (1921), 3915.
[19] *Ibid.*, 10 (1916), 1943.
[20] *Ibid.*, 10 (1916), 3176.
[21] THIS JOURNAL, 13 (1921), 1034.
[22] Brit. Patent Application 177,493 (1922).
[23] *J. Soc. Chem. Ind.*, 61 (1922), 81T.
[24] *Ann.*, 348, 144.

($R_2N—CS—S—S—CS—NR_2$ and RO—CS—S—SCS—OR)

Bruni[23] offers a second theory for the action of zinc oxide, which parallels the above-mentioned theory up to the formation of the zinc salt of the thio acid or mercaptan. He states that sulphur reacts with the zinc salt to form a disulphide and zinc sulphide according to the equation:

$$(R_2N—CS—S—)_2\ Zn + S = (R_2N—CS—S)_2 + Zns$$

This disulphide is then believed to vulcanize the rubber by reverting to the monosulphide, which in turn reacts with elemental sulphur to reform the disulphide. Twiss[25] again calls attention to the need of zinc oxide for bringing out the full effect of the disulphide, even when the disulphide is formed outside the rubber mix and compounded as such, under which conditions Bruni's theoretical need or zinc oxide should be absent. Twiss believes that there is some reaction product common to disulphides, dithiocarbamates, zinc oxide, and sulphur, which forms the true accelerator or vulcanizing agent.

Further in regard to the thiuram disulphides, it has been shown that they do not vulcanize rubber-sulphur-zinc oxide mixes at room temperature as do the zinc salts described below, while the action of hydrogen sulphide,[4] even at ordinary temperatures, changes the disulphide to a dithiocarbamate, and in the presence of zinc oxide starts the process of rapid vulcanization without the application of heat. The above-mentioned action of aniline in causing thiuram disulphides to vulcanize rubber at ordinary temperatures may be explained in the same manner according to Fromm[24] who showed that aniline and other primary amines easily react with these disulphides to form dithiocarbamates. Thiuram disulphides as well as dithiocarbamates, derived from secondary amines, are found by Twiss to be much more active than those from primary amines.

In general, the study of the mechanism of vulcanization seems to be concentrating on the action of accelerators which need the aid of zinc oxide. Little has been published on the effect of litharge, lime or magnesia. The action of aniline, aldehyde ammonia, para nitroso-dimethyl aniline, and many other accelerators still remains practically untouched. The important factor of temperature, the nonactivity of certain accelerators at temperatures where others are violently active, has been commented on as due to the relative stability or instability of the reaction products, but a satisfactory explanation has not yet appeared.

This, in brief, is the present status of the chemistry of rubber vulcanization. The advent of the organic accelerator has furnished the rubber chemist definite chemical compounds for use in vulcanization and provided a means of throwing some light on the mechanism of the process. In general, the polysulphide theory is fairly well accepted; in detail there are many differences of opinion and many unsolved problems. History, in connection with rubber chemistry, is being made at a rapid rate and we await with extreme interest the developments of the immediate future.

German Tire Competition in Mexico

(By U. S. Consul Walter F. Boyle, San Luis Potosi, Mexico)

GERMAN fabric tires in the 30 x 3½ inch size are competing in the San Luis Potosi market. The quality of the tire has but little bearing, owing to the lack of attention to tire inflation, rapid deterioration of tires through exposure to the weather when not in use, short distances, and rough cobblestone roads. Owners of the small cars in the taxi service buy the cheapest fabric tire to be had, and the German Continental tire sells for 36 pesos, as against 42 pesos for a standard American make of the same size.

In larger sizes cord tires are used almost exclusively, and the lower-priced German article is making practically no headway because of the superiority of the American tire.

San Luis Potosi might offer a favorable field for American houses to market "seconds" in the fabric grade of 30 x 3½ inch tires. The introduction of "seconds" in any other grade would be a very short-sighted policy, as it would lessen the high regard in which American cord tires are now held.

Conditions in German Rubber-Goods Industry

(By U. S. Consul F. T. F. Dumont, Frankfort-on-the-Main)

Rubber products such as tires, soles and heels, coats, hose, surgical and hygienic goods, rubber stamps, and miscellaneous mechanical articles are largely manufactured in the Frankfort (Germany) district, there being important factories in Frankfort, Fulda, Mainz, Offenbach, Hanau, Giessen, and Darmstadt. All of these factories have been obliged, owing to the continued depreciation of currency and increase in running expense, to raise again the selling prices for tires, and the outlook is that the prices for rubber goods of every description will also be increased within a short time.

The *Frankfort Nachrichten*, under date of July 12, referring to the present conditions in the German rubber-goods industry, says: "There is no cause for the moment to complain of business in most departments of the German rubber industry. In seasonal articles, especially those for traveling and bathing, a slight falling off is noticeable. The demand for some special articles has also decreased somewhat during the past month. On the other hand, the export of numerous products continues very good. Business in mechanical rubber goods has been normal, and in toys and sporting articles good. Rubber goods for personal wear have become popular and find a good market. There is also a satisfactory demand for surgical and hygienic rubber goods. Various industries, such as brewing, textile, and mining, have placed considerable orders, with the idea that prices will continue to rise. In small rubber articles the export to America is quite satisfactory, particularly hard rubber combs, syringes, and rubber novelties."

Rubberized Tank for Airplanes

An interesting new use for rubber has been developed in England by the India Rubber, Gutta Percha and Telegraph Works, for which the company was given a first prize by the British Government. This relates to the use of rubber in the construction of the tanks used on airplanes for the storage of gasoline. The tank is made from thin sheet steel and the entire tank is covered with a vulcanized rubber jacket, which can be readily removed at any time. The rubber covering is about one quarter of an inch thick. The tank readily conforms to the imposed conditions (capacity 30 gallons plus 5 per cent excess and maximum weight 1.75 pounds per gallon). Several severe tests were made with this tank, bullets being fired at it and penetrating through it completely without causing inflammation of the gasoline. The rubber closes right over the point at which the bullet pierced the tank, so that it is difficult to tell just where the bullet went through.

"Foreign Commerce Handbook"

An exceptionally usable "Foreign Commerce Handbook", the first of its kind, has just been issued by the foreign commerce department of the Chamber of Commerce of the United States. Within the space of thirty-one pages this publication condenses much information as to sources of service in foreign trade. Its alphabetical arrangement makes it a handy reference work for the busy exporter or importer. The book contains also a list of topics of national importance that are engaging the attention of the chamber's foreign commerce department committee under the chairmanship of Willis H. Booth of New York.

Sodium Bisulphite in Sheet Rubber Manufacture

Latex treated with a small quantity of sodium bisulphite yields a sheet rubber with an attractive glossy appearance; otherwise bisulphite is unnecessary and indeed the resulting sheet rubber may dry exceptionally slowly. With the addition of 0.1 and 0.2 per cent of sodium bisulphite to latex, the resulting sheets needed smoking for 18 days; the rate of vulcanization was somewhat reduced, but the tensile strength of the vulcanized product was satisfactory. See Bulletin Rubber Growers' Association, 1922, 4, 228-9.

NEWS OF THE INDUSTRY

Increasing Demand for Latex

The weekly review published by Zorn & Leigh-Hunt, London stockbrokers, under date of Nov. 16 was printed on Kaye's rubber latex paper which appeared to have advantageous folding, tensile and finish qualities. The firm had the following to say about the increasing demand and uses for rubber latex:

"One of the most encouraging of recent developments in the plantation industry is reflected in the demand for rubber latex. The liquid is now being shipped in bulk from the East in comparatively large quantities. Its use in paper-making adds greatly to the quality of the product. Both here and in America paper manufacturers are now using rubber latex in increasing quantities on a commercial scale, and in almost every civilized country of the world shipments of latex for experimental purposes have been called for. In other trades, too, the demand for latex is developing, and the new uses of rubber in this form promise to have an important bearing on the future of the industry."

Kelly Tire Prices Increased

Announcement is made of a 10 per cent horizontal increase in the prices of casings, tubes and truck tires by the Kelly-Springfield Tire Co. This applies only to dealers' orders placed in December. Higher prices of rubber and cotton are said to be the reason for the increase.

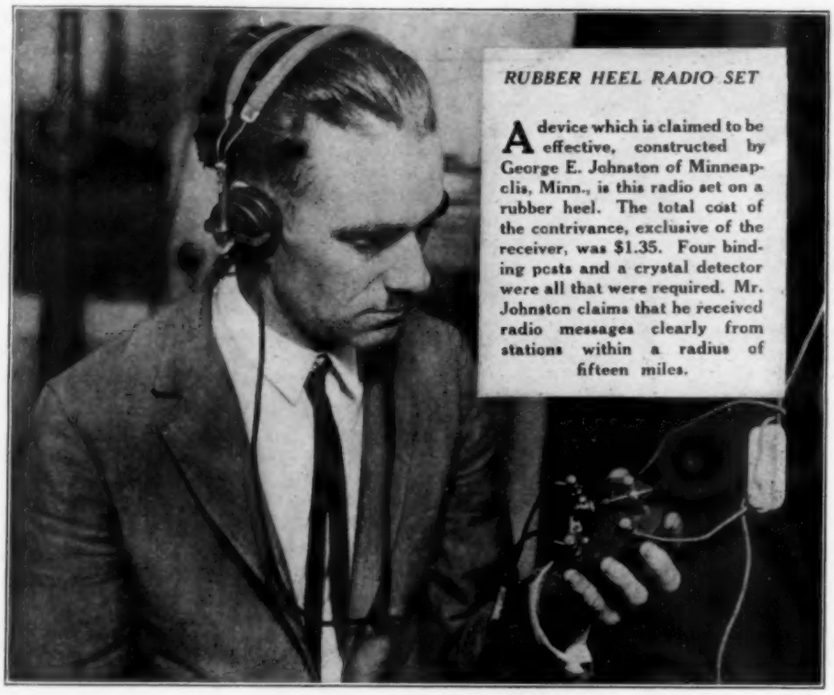
Bergougnan Tires Higher

Due to the rise in crude rubber and tire fabric prices and the inability of the company to meet the demand for Gold Seal cords, the Bergougnan Rubber Corp., Trenton, N. J., has announced an increase of 12½ per cent in the prices of its cord and fabric casings and inner tubes. The plant is operating at full capacity.

New Hard Rubber Factory

J. G. Blackstock has leased the former plant of the Ohio Motor Vehicle Co., Cleveland, for ten years, with the option of purchasing up to $60,000 by Dec. 1, 1925, for the purpose of manufacturing hard rubber products. The plant has a frontage of 392 feet on Oakview road N. E., and is 196 feet deep. There is also a brick building 50 by 300 feet and several other large buildings on the property. Mr. Blackstock is forming a company to start factory operations.

Radio Concerts from a Rubber Heel



RUBBER HEEL RADIO SET

A device which is claimed to be effective, constructed by George E. Johnston of Minneapolis, Minn., is this radio set on a rubber heel. The total cost of the contrivance, exclusive of the receiver, was $1.35. Four binding posts and a crystal detector were all that were required. Mr. Johnston claims that he received radio messages clearly from stations within a radius of fifteen miles.

Photo by International

Mid-West November Meeting in St. Louis

The regular monthly meeting and luncheon of the Mid-West Rubber Manufacturers Association held at the Missouri Athletic Club, St. Louis, Mo., on Nov. 14, brought together more than sixty members of the rubber trade. The board of directors and executive meetings were combined and called to order by W. W. Wucher, president of the Association.

The chief topic discussed at this meeting was a uniform system of cost accounting for small tire manufacturing plants. A representative of a Cleveland manufacturer who is an expert accountant explained various methods, as did an expert representing a St. Louis tire firm, who dwelt at length on the methods used at their plant. In order to determine the most accurate and efficient method of figuring costs a committee of three was appointed to investigate and gather information relative to the various systems at present used and to report thereon at the next meeting of the association.

In the discussion which followed the luncheon several of those present, reviewing the tire situation, were in favor of forming a co-operative selling organization to market the product of member tire manufacturers, as this plan would result in a reduction in sales costs and would eliminate expensive branches and salesrooms now being maintained throughout the country.

Those present representing fabric and crude rubber firms stated that the steady advance in price of these two raw materials will be sufficient to insure an increase in the price of tires in the near future.

The next meeting and annual banquet of the association will be held on January 30, 1923, at the Hotel Morrison, Chicago, during the week of the Chicago Automobile show. A committee to arrange for the entertainment was appointed, consisting of the following members: J. Matthias, chairman; C. C. Christie, J. Tumpeer, A. C. Eide, M. W. Rozar, W. E. Wilson, Chas. J. Venn, P. P. Parker, C. A. Swinehart.

This banquet is being looked forward to as the largest and most successful gathering in the history of the organization.

Dunlop's Buffalo Plant Begins Operations

To Employ Up to 10,000 *Men and Make* 13,000 *Tire Casings Daily --* $15,886,000 *Bond Issue to Finance American Factory and Sales*

The great plant of the Dunlop Tire & Rubber Corporation of America at Buffalo, N. Y., erected at a reported cost of $20,000,000 but never placed in operation except for the making of test and sample tires, will be opened at once for active factory operations. Between 8,000 and 10,000 men will be employed and the capacity of the plant will be 13,000 tires daily, probably to be increased as sales justify.

The financing of the American factory and sales agencies, which will be established throughout the United States, will be provided for in an issue of $15,886,000 first mortgage 7 per cent bonds purchased by a syndicate of New York City bankers. These are twenty-year bonds and will be offered to the public on a basis that will return about 7½ per cent interest.

The contract of sale to the New York syndicate provides that the original British Dunlop company shall deposit with the American corporation sufficient of its pound sterling first mortgage 7 per cent bonds to amount to $16,000,000 and the bonds sold to American investors will be issued against them, thus becoming a first mortgage on the American plants of the corporation and also on properties of the parent corporation abroad.

The American corporation has been reorganized although it retains the name of the Dunlop Tire & Rubber Corporation of America. Sir Eric Geddes, brother of the British Ambassador at Washington, has been made chairman of the board, and Frederic W. Allen, of Lee, Higginson & Co., will represent banking interests on the board. Other members are Pierre du Pont, J. J. Storrow, Sir. J. George Beharrell, Robert K. Pomeroy, banker of Buffalo, Louis Bergen and Charles A. Proctor, directors of the English company; Frederic C. Walcott and J. Westren, general manager.

Sir Eric Geddes, the new chairman of the Dunlop Tire & Rubber Corporation of America, received his early business training in this country. It was as plain Eric Geddes that he engaged in lumbering and afterward in railroad management in West Virginia, from where he went to India in forestry and railroad work. In 1904 he was called to England to become general manager of the North Eastern Railways, which place he held until the war's outbreak. Sir Eric is now in England but will return to this country in January to direct the activities of the American company.

The Dunlop Tire & Rubber Company of Great Britain is one of the largest enterprises of its kind in the world. It was the maker of the original pneumatic tire for use on automobiles and bicycles. It has factories in England, in France and in Germany, and with the opening of the Buffalo works will have its factory here. It has allied factories in Canada, Australia and Japan, and selling companies all over Europe, Asia, Africa and South America.

The Dunlop company owns its own vast rubber plantations in Malay, and in Rochdale, near Manchester, England, it controls one of the largest cotton mills in the world. It also controls a branch cotton mill subsidiary to its Buffalo plant at Utica, N. Y.

Goodyear Suit in Court

The first of what promises to be a long-drawn-out series of legal battles ending either in compromise or in the United States Supreme Court, in the suits of Mrs. Laura L. T. Weiss of Cleveland attacking the $85,000,000 reorganization and financing plan of the Goodyear Tire & Rubber Co. of Akron, started in the Common Pleas Court of Akron before Judge W. J. Ahern on Dec. 1. Arguments were heard on a motion to quash service on Owen D. Young and Clarence Dillon, of Sherwin, Young & Dillon, two New York financiers who with another hold 10,000 shares of management stock which the plaintiff desires to have cancelled and surrendered. The question was on the legality of service by newspaper publication.

In his argument before the court Attorney Constant Southworth, representing the defense, pointed out that Mrs. Weiss controlled only one twelve-thousandth part of the old Goodyear common stock and one eight-thousandth part of the preferred.

Judge Ahern reserved decision, and meanwhile will consider briefs to be submitted by both sides. Other phases of the four suits will come up for argument in court in the near future.

Peter D. Thropp Dead

Peter D. Thropp, vice president of John E. Thropp's Sons Co. and Eureka Flint & Spar Co., treasurer of de Laski & Thropp Circular Woven Tire Co., and director of the Bergougnan Rubber Corp.—all of Trenton, N. J.—died suddenly from apoplexy on Nov. 25 at the age of fifty-six. He was one of the sons of John Edwin Thropp, founder in 1878 of the machinery business that bears his name.

Young Thropp attended the public schools and graduated from Trenton High School and Stewart Business College. Entering his father's business he served a four years' apprenticeship in the machine shop. Three years later he became general foreman, a position which he held for about ten years.

In 1904 Mr. Thropp and Albert de Laski of Weehawken, N. J., started to develop a machine for making circular woven fabric to be used as carcass for automobile tire casings. Eventually he devoted all of his time to the production of machinery and equipment for perfecting tires and obtained many patents on improved tire-building equipment.

Mr. Thropp was a member of the Elks and Masonic fraternities, also the Knights Templars. He was prominent in the membership of the Trenton Country Club and the Carteret Club.

Syracuse Rubber Receivership

The federal court has appointed William Rafferty receiver for the Syracuse Rubber Co., Syracuse, N. Y., makers of the Syracord tire. Although the company's statement showed assets $360,000 more than liabilities, officials said that the corporation was without credit resources and unable to borrow sufficient funds to keep the business going.

The creditors have organized and will petition Judge Cooper to allow Receiver William Rafferty to continue the business. The total claims are $450,000 and the assets $360,000. Not more than $250,000 will be required to make the bankrupt a success.

E. A. Pam of Fred Stern & Company of New York City was named chairman of a creditors' committee to take up tentative reorganization plans. The other members of the committee will be Adolph Ernst of Thornett & Fehr, New York City; F. C. Chamberlin of William Whitman Company, Boston; and J. W. Clark of Jencks Spinning Co., Pawtucket, R. I. The first two companies named are rubber corporations and the latter fabric companies. Their combined claims exceed $100,000.

$10,000,000 Auto Plant for W. Va.

A group of Detroit capitalists in which William Jordan is interested has announced the proposed building of a $10,000,000 automobile plant at Ridgeway, W. Va. It was reported that Harvey S. Firestone, president of the Firestone Tire & Rubber Co., Akron, Ohio, was financially interested but Mr. Firestone denied this. He said he had been approached on the proposition but declined to join the enterprise. His only interest, he added, was in getting tire contracts for any new car or truck that might be produced in the plant.

Phoenix Assigns

The Phoenix Rubber Co., Inc., Brockton, Mass., has made a voluntary assignment of its assets to I. Manuel Rubin, attorney for the creditors. All machinery, factory equipment, supplies, and goods in process of manufacture are included.

Silurium Co. for Ashtabula, O.

A. H. Noah, former treasurer of the Diamond Rubber Co.; C. W. Mc Laughlin of the Mohawk Rubber Co., Dr. R. L. Clements, former sales manager of the S. S White Dental Mfg. Co., and others have formed the Silurium Mfg. Co. which is to manufacture a new composite product, silurium, in a plant at Ashtabula, Ohio. This substance was discovered by a former Goodyear employee and is said to possess many remarkable properties. It combines readily with rubber and other basic elements. The raw material is to be obtained from land near Joplin, Mo., which is in the heart of the tin and zinc region.

E. W. Steinbrenner is president of the new concern; Mr. Noah is first vice president: F. W. Seywert, second vice president;Mr. Mc Laughlin, third vice president; C. S. Ling, fourth vice president; A. W. Harris, secretary; W. M. Fisher, treasurer; R. L. Clements, general manager; K. L. Kinsley, S. H. Caulfiel, and F. E. Crosby, directors.

Goodyear Directors Sue Co.

Francis Seiberling and J. L. Robinson, Goodyear directors, have petitioned the court stating that they desire to join Mrs. Laura L. T. Weiss of Cleveland in attacking the legality and validity of the Goodyear refinancing and reorganization plan, a full account of which proceeding was published in these columns some weeks ago. The directors say they have examined the papers of the plaintiff and believe the allegations therein to be true.

The Goodyear company has filed motions to quash the Weiss suit. Arguments will probaby be heard in the common pleas court in Akron shortly.

Knox President Resigns

Frank O. Levering, president, and H. M. Lybarger, first vice president and director, of the Knox Tire & Rubber Co., Mount Vernon, Ohio, have resigned following a meeting of stockholders who approved the expense account of F. D. Spencer, former secretary of the company who resigned recently. A reorginization is in progress.

Lee Net Earnings, $278,351

Lee Rubber & Tire Co., New York, reports net earnings for nine months ending Sept. 30 at $278,351 after deducting taxes and other reserves. Net sales were $5,167,253. The company's surplus on Sept. 30 was $414,388. Unit sales of tires increased 15 per cent over the same period in 1921; unit sales of tubes, 40 per cent.

Gryphon Net Profits, $175

Although the six months' statement, ending June 30 last, of the Gryphon Rubber & Tire Corp., New York City showed manufacturing profits of $105,-043 the net profits were only $175, according to the itemized income account.

RAILROAD TO USE RUBBER TIRES

A railroad 181 miles long, from Bend to Lakeview, Oregon, which is planned by Portland capitalists, will have wooden rails and the cars will have metal-flanged wheels and hard rubber tires, if the present ideas of the promoters are carried out. Arthur W. Arnold of Portland, Ore., is the inventor and chief mover in the scheme which is being pushed under the name Arnold Auto Rail Co. Others associated with him are J. P. Newell, railroad engineer; M. J. Buckley, railroad superintendent; W. P. La Roche, Portland city attorney; and Thomas Mc Cusker.

Plant Paves Akron Street

G. S. Brooks of Chicago, superintendent of the zinc oxide department of the Anaconda Copper Co., which is building a new plant in North Akron near what formerly was known as Bettes Corners, has secured permission from city officials to open up a new street running south from Tallmadge avenue and on the east side of the company's industrial property. The street will be improved to a width of fifty feet and paved by the company, according to Brooks. The road will be 1,500 feet long.

The city was asked to open up and improve the proposed new street, but when City Manager M. P. Tucker announced the city's finances precluded any new street work this year, the company declared it would do the work itself. The new street is to be known as Anaconda avenue.

The first unit of the new plant is nearing completion and will be in operation by the first of the year, according to Mr. Brooks and F. O. Case of Chicago, who accompanied him to Akron recently.

Electric Hose Moves

The Electric Hose & Rubber Co. has moved its Philadelphia office into new quarters in Rooms 911 and 912, Land Title Building, corner Broad and Chestnut streets. The new telephone numbers are Spruce 7740 and Race 7653.

Wellman Plant Prospering

The Wellman-Seaver-Morgan Co., manufacturers of heavy machinery used in the rubber industry, has doubled production at its Akron plant, according to an announcement by President E. S. Church. For some time the company has been operating on a thirty per cent basis. At present 350 men are employed.

Barberton Plant For Sale

The Biltwell rubber factory at Barberton, Ohio, with 54,000 square feet of floor space and more than eighteen acres of land, is on the market. The receivers, the Merchants National Bank of Massillon and the Ohio State Bank of Akron, are advertising the property for private sale.

Buffalo as a Rubber Center

John A. Clausen, of the Harrison Real Estate Corporation, Buffalo, recently made these interesting statements in a newspaper article about the importance of that city in the rubber industry:

"It is in the commercial world of mechanical rubber products that Buffalo assumes its important position in this branch of industry. Buffalo is recognized as being the largest manufacturing center of rubber products for railway equipment in the United States. From here are supplied 107 railway systems with airbrake hose, hose for car heating, engine tender, water and signal requirements. Buffalo has a daily production capacity of 10,000 airbrake hose.

"We are also the exclusive source of supply for the largest users of pneumatic tool hose in the world. The largest purchasers of conveyor belts fulfill their requirements from Buffalo. Throughout every continent and in nearly every civilized country on the globe, mechanical rubber products Made in Buffalo are in service.

"The rubber industry in Buffalo employs approximately 1300 persons. The value of the annual output of products totals about $9,000,000. The annual payroll of the industry is approximately $1,500,000.

"The part rubber plays in modern construction and commerce is highly important. The building of bridges, ships, subways and skyscrapers is facilitated by various types of pneumatic tools, all dependent for their operation on rubber hose. The time necessary for loading and unloading ships has been decreased many times by the use of heavy suction and discharge hose, especially in the handling of oils, gasoline, molasses and other products in liquid and semi-liquid form.

"Ore, coal, limestone, etc., are quickly handled by means of gigantic rubber conveyor belts. Some of these belts weigh over 15,000 pounds and have a carrying capacity of thousands of tons per hour. Buffalo leads in the manufacture of these. Modern mining engineering has its very foundation linked with the use of rubber products, principally hose of various kinds and driving and conveying belts. In the drilling of oil and gas wells, rubber products are of vast importance. The wonderful growth of the United States and its industries is generally attributed to our railroads. The railroads of today, however, are absolutely dependent on rubber products for their operation and maintenance."

New Cord Tire Machine

A cord tire building machine which the inventor claims will build and finish a cord tire in less than ten minutes has been brought out by Ernest F. Kling of Batavia, N. Y., former factory and general manager of the Batavia Rubber Co. Labor and material are reduced to about 45 per cent of the present amount by eliminating processes in manufacture, scrap, and other waste, according to Mr. Kling. A patent has been applied for.

Stevenson Advisory Committee

The British Colonial Office announces that acting on the recommendations of the recent committee, the various associations representing the rubber industry in British dependencies have nominated the following to serve on the Advisory Committee for a period of one year. The function of the committee will be to advise the Secretary of State for the Colonies on any questions which he may refer to it; but it will not, of course, have any executive powers.

Sir E. Birch, K.C.M.G. (Association of British Malaya).
T. C. Owen (Ceylon Association).
H. Eric Miller (Rubber Growers' Association).
Sir E. Rosling (Rubber Growers' Association).
Lieut.-Col. J. Sealy Clarke (British Rubber Tyre Manufacturers' Association).

The India-Rubber Manufacturers' Association has also been invited to nominate a representative. Sir E. L. Brockman, K.C.M.G., will serve in his capacity as agent of the Malay States' Information Agency. At the Duke of Devonshire's invitation Sir James Stevenson, Bt., G.C.M.G., will act as chairman, and Sir G. E. A. Grindle, K.C.M.G., will be vice-chairman. The secretary of the committee will be G. E. J. Gent, D.S.O., M. C. of the Colonial Office.

Singapore and Penang Free Ports under Restriction Plan

The latest advices from Singapore and Penang indicate that those cities will be free ports under the operations of the Stevenson export duty and restriction-of-production plan. This arrangement will enable them to handle all trans-shipment of crude rubber as usual. Rubber stocks already at these ports will be shipped duty free. In the case of Singapore the export duties will be paid on the mainland before the rubber reaches this port for trans-shipment.

It is estimated that the general rate of duty at Malaya is a little more than one-half pence per pound and under this figure in Ceylon. In imposing duties one gallon of latex is considered equal to three pounds of dry rubber.

Italian Rubber Co. Interested in Azores-Rome Cable

A large Italian rubber company, probably either the Societa Pireli or the new 18,000,000 lire concern, the Societa Anonima Lavorazione Gomma ed Affini, is interested in constructing the proposed cable from the Azores to Rome, according to a statement of Newcomb Carlton, president of the Western Union Telegraph Co., which will build the New York—Azores link. Mr. Carlton has completed arrangements with Italian interests in London and the Italian government has promised a subsidy. The new premier, Dr. Mussolini, is said to be supporting the cable project which may be extended to Constantinople eventually.

A. F. Osterloh

A. F. Osterloh 20 Years with Goodyear

When A. F. Osterloh, general manager and vice president of the Goodyear California plant, returned from a recent 5,000-mile trip covering the various branches of the company he received a pleasant surprise. It was in the nature of a gold service pin designating his twenty years of active service as a Goodyearite.

Osterloh is one of the three California employees who have completed a score of years' service. He joined Goodyear in October, 1902, acting as general line salesman in the territory about the Chicago branch. He was later made Chicago branch manager, then western sales manager. In 1913 he came to Akron as assistant secretary. Two years later he was elected secretary. Upon the organization of the California plant Osterloh went west, taking the position he now holds.

Production at the California plant totals 3300 casings and 3600 tubes daily.

New $1,000,000 Ajax Plant

The Sandusky, Ohio, Chamber of Commerce on Nov. 27 received a check for $7430 from the Ajax Rubber Co. to bind a contract by which the company agrees to erect a $1,000,000 plant in that city and maintain a yearly payroll of $1,000,000. The 90-acre site was purchased by popular subscription.

U. S. Rubber Redeems Notes

The United States Rubber Co. has called for redemption on Dec. 1, the Central Union Trust Co., New York City, all of its outstanding $6,000,000 5-year 6 per cent notes, dated Nov. 1, 1918, at 102 and interest.

Personals

George L. Lawrence, Jr., has resigned as factory manager for the Boston Rubber Shoe Co. to become factory manager for the Tyre Rubber Co., Andover, Mass. He was with the former company for about twelve years.

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Charles Rukamps, secretary of the Interlocking Cord Tire Co., Akron, Ohio, has resigned but has not announced any future plans.

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R. R. Jones, chief engineer of Firestone, represented Akron at the annual meeting of the American Society of Mechanical Engineers in New York, Dec. 4 to 7.

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R. M. Gage, former chemist at the Seiberling plant, has been named general superintendent of the Vulcan Rubber Co., Erie, Pa.

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Ernest E. Buckleton, managing director of the Northwestern Rubber Co., Liverpool, England, was a recent visitor at the Akron plants. During a recent tour of German rubber factories he found them working overtime and paying about one-fourth of the wages paid in this country's rubber plants.

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John D. Cary of New York is the new sales manager of the Anderson, Ind., factory of the International Rubber Co. J. D. Wiggins is general manager.

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Allan Barrows, superintendent of Goodyear Cotton Mills, Goodyear, Conn., has resigned to enter the cotton brokerage business with Cooper & Brush, Providence, R. I. C. W. Young is his successor at Goodyear.

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F. Lecoy, a representative of the French Antimony Corporation of Paris, France, was a Goodyear visitor recently.

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Announcement was made at Swinehart that H. W. Holcombe has been named manager of the company's New York branch.

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W. C. Blake, formerly with Goodyear branch at New York, is now with Miller at its Chicago branch.

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H. J. Haigh, for several years treasurer of F. R. Henderson & Co., rubber importers of New York, has resigned and become treasurer of the Brighton Mills, Passaic, N. J.

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Emmet V. Pollard, formerly special representative for General at New York, is now manager at the Dallas, Texas, branch.

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C. O. Brandes, for many years export manager at Firestone, is now export manager for Erie Tire at Erie, Pa.

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W. T. Brown, formerly with Miller Rubber, is now vice president of Rayen Rubber Co., Ravenna, Ohio.

Litchfield on Mexican Situation

"Western cities were affected but little by the business depression so evident in this part of the country and are now in better financial condition than ever before."

So, said P. W. Litchfield of Goodyear, upon his return from a six week's trip through New Mexico, Mexico, California and Arizona.

Mr. Litchfield announced that Goodyear tire production at the California plant will shortly be increased to 4,000 daily.

While in the west Litchfield spent a week in Mexico City, Mexico.

"The people in Mexico have but little faith in paper money and when making a purchase they always pay in cash, silver or gold," he said.

"It is very common to see people walking about the streets with bags of silver in their hands."

Mr. Litchfield attributes the present rate of money exchange in Mexico to the fact that paper money is seldom used.

"Everything is quiet in Mexico," the factory executive reports, " and it seems that the present form of government is entirely in keeping with the people's ideas."

While in the west, Mr. Litchfield also visited the Goodyear cotton plantation of 4,000 acres.

Arnold to Confer in Akron

Julian Arnold, commercial attache of the United States legation in China, will confer with representatives of the rubber industry in Akron in the near future. W. W. Hall, of the foreign department, Akron chamber of commerce, is arranging the conference by request of the U. S. Department of Commerce. Mr. Arnold has a fund of first-hand information on business opportunities in China which the department is desirous of placing before the export departments of the large rubber factories.

THAT NOISY "NURSERY" AT MILLER'S

"WAAH ! !" Visitors at the Miller office in Akron, in passing the factory building, are startled by the lifelike resemblance to a baby's cry which emanates from a second-story window.

"Waah! Waah!"

Not only one, but a dozen babies crying at once.

"What can it be?" the visitor inquires.

William Mc Fee, Miller gateman, says he receives inquiries all day long from astounded passersby.

He replies that the "nursery" noises are the cries of clown doll-babies hundreds of which are born each day in the novelty department. The cry comes when the doll is inflated for inspection.

$1,000,000 Plant for Roanoke

Roanoke, Va., is to have a new $1,000,000 rubber factory, according to an account in the Roanoke *Times* of Nov. 25. The promoters are said to be experienced rubber men from Akron, Ohio, and to be interested in the following rubber factories now in operation:

Perfection Rubber Company, Fort Madison, Iowa; Tuscan Rubber Company, Carlton, Ohio; Chester Rubber Company, Chester, W. Va.; Lake Shore Rubber Company, Elyria, Ohio; Ursirus Rubber Company, Ursirus, Ohio; Miller Rubber Company, Akron, Ohio.

The plan is to secure all of the officers of the company from among local business men of Roanoke, the factory manager to be brought from Akron or another city. Tire casings, tubes, hose, heels, gloves, aprons, toy balloons, druggist sundries, and other rubber goods will be manufactured.

American Rubber Manufacturers at British Expositions

At the Shoe and Leather Fair recently held at Royal Agricultural Hall, London, considerable attention was attracted to the use of raw plantation crepe rubber for soling boots and shoes, especially for sporting purposes. The general opinion of the exhibitors was that there would be a greater demand than ever for rubber footwear and rubber soles and heels on leather footwear.

American rubber manufacturers represented were the Goodyear Tyre & Rubber Co., Ltd., the Hood Rubber Co., Ltd., United States Rubber Co., and the Kaufman Rubber Co., Ltd., of Kitchener, Canada.

At the annual motor show of the Motor Manufacturers and Tyre Association held at Olympia and White City Nov. 3 to 11 were represented the Bergougnan Tyre Co., the Dunlop Rubber Co., the B. F. Goodrich Co., Ltd., the Goodyear Tyre & Rubber Co., Ltd., and A. Schrader's Sons, Inc.

$6,500,000 Co. Selling Stock

The Subers Rubber Products Co. is a new Ohio corporation with offices in the National City Building, Cleveland. It is exploiting the invention of L. A. Subers, called the L. C. I. tubular fabric, the letters standing for Laminated Cohesive Interwound or Interlaid. Certain advantages are claimed for this tubular fabric, such as greater resistance to atmospheric conditions, and improved strength, wear, durability, and general utility of products made from such fabric.

The company is offering $3,000,000 of first preferred stock, $2,000,000 of second preferred, and $1,500,000 of no par value common stock. Mr. Subers is president and W. D. Young treasurer. No other officers or directors are mentioned in the forty-page illustrated prospectus published by the new concern.

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

November, 1920 to October, 1922, inclusive

"Production" and Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

(Compiled by The Rubber Association of America, Inc.)

	PNEUMATIC CASINGS				INNER TUBES				SOLID TIRES			
MONTH	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
November, 1920	36	5,880,016	649,742	806,023	40	6,131,935	742,815	920,938	11	298,875	21,355	34,217
December, 1920	43	5,508,380	506,111	1,327,153	43	5,786,929	508,446	1,481,285	12	303,473	16,297	40,828
January, 1921	45	5,319,605	703,430	965,417	47	5,586,163	740,824	1,042,617	12	303,753	21,220	29,116
February, 1921	45	5,193,018	819,892	1,073,756	46	5,415,464	916,627	1,129,881	12	304,374	23,365	29,599
March, 1921	46	4,597,103	1,163,314	1,614,651	48	5,044,861	1,346,483	1,643,690	12	283,800	28,710	43,926
April, 1921	49	4,527,445	1,651,418	1,785,951	51	4,916,772	1,762,122	1,983,571	12	269,985	28,859	42,080
May, 1921	59	4,451,668	2,100,917	2,085,882	57	4,751,880	2,210,040	2,342,567	12	264,663	35,156	40,122
June, 1921	63	4,154,456	2,313,265	2,643,850	60	3,835,098	2,359,928	3,232,673	11	240,336	28,395	49,867
July 1921	63	3,892,037	2,570,524	2,757,581	61	3,122,815	3,020,981	3,603,248	11	220,003	35,123	55,678
August, 1921	66	3,934,853	3,043,187	2,894,442	64	3,649,319	4,430,152	3,804,060	11	216,367	55,694	66,866
September, 1921	63	3,340,798	1,929,268	2,047,929	62	3,827,830	3,274,822	2,645,758	11	161,832	37,441	50,276
October, 1921	64	3,545,030	1,928,271	1,675,169	64	4,732,016	2,843,918	2,016,371	10	163,299	46,274	45,911
November, 1921	64	3,908,342	1,756,555	1,342,519	63	5,203,568	2,126,211	1,540,299	10	173,451	43,537	34,556
December, 1921	64	3,696,519	1,839,738	1,980,264	64	4,731,021	2,070,098	2,522,710	10	168,515	40,478	39,520
January, 1922	66	4,174,216	2,055,134	1,596,806	66	5,246,647	2,343,393	1,889,724	11	181,769	40,224	33,294
February, 1922	66	4,691,329	2,084,308	1,562,365	65	6,141,956	2,596,774	1,702,583	11	183,448	39,492	36,805
March, 1922	63	5,183,286	2,645,790	2,073,963	63	6,991,118	3,017,511	2,090,737	11	182,197	49,433	48,350
April, 1922	65	5,464,336	2,401,187	2,086,651	65	7,230,096	2,650,573	2,329,343	11	173,748	46,664	62,309
May, 1922	65	5,523,095	2,721,503	2,639,273	65	7,189,552	2,970,696	2,938,947	11	170,904	57,640	60,711
June, 1922	64	5,042,147	2,838,890	3,133,260	64	6,186,534	3,130,629	3,973,679	11	169,808	66,089	63,408
July, 1922	63	4,834,106	2,476,636	2,695,095	63	5,675,839	3,068,199	3,630,744	11	176,375	71,505	60,425
August, 1922	63	4,629,392	2,905,209	3,039,823	63	5,207,228	3,808,224	4,220,055	11	189,698	84,313	69,435
September, 1922	64	4,612,037	2,504,744	2,502,106	64	5,164,757	3,501,442	3,558,971	11	200,016	82,767	66,797
October, 1922	64	4,682,958	2,674,662	2,588,770	64	5,488,033	3,787,758	3,420,680	11	213,942	85,480	71,275

$2,367,608 Suit by Cotton Mill

The Couch Cotton Mills, Inc., of Atlanta, Ga., has brought suit against the Manhattan Rubber Mfg. Co., Passaic, N. J., in the sum of $2,367,608, alleging breach of contract on cotton duck agreements by the latter company. The mills charge three contract violations for which damages are demanded. No statement was issued by the Manhattan company.

Malay Goods Duty Free

The Chief Secretary for the Federated Malay States, in exercise of the powers conferred on him by section 5 of the Customs Enactment 1920, has exempted from the payment of export duty all rubber goods manufactured in Malaya, this exemption to remain in force for five years from Sept. 1, 1922.

Norwalk's New York Office

The Norwalk Tire & Rubber Co., Norwalk, Conn., has opened a branch sales office in New York City with John W. Whitehead, assistant secretary of the company, in charge. A western branch was recently established in Chicago.

Seamless on Two Shifts

Double shifts working night and day in the dipped goods department are rushed at the plant of the Seamless Rubber Co., New Haven, Conn., manufacturing sundries for the United Drug Co. It is said to be $500,000 behind in filling orders. It is estimated that Seamless will earn between fifteen and twenty per cent on its total investment this year

Amazon on Dividend Basis

Amazon may declare a dividend shortly after the first of the year, officials of the company said in reviewing business conditions at the plant. R. C. Fulmer, new president expects to increase production 250 to 600 tires daily shortly after first of the year if spring datings continue at their present rate.

Sponge Co. Changes Name

The Sponge Tire & Rubber Co., Red Wing, Minn., has changed its name to Goodhue Tire & Rubber Co., by vote of its stockholders who also authorized a bond issue of $150,000 of which $100,000 has been underwritten. The plant is operating at capacity making Red Wing tires.

Latex Co. Flourishing

According to T. W. Meiklejohn, president of the Latex Rubber Co., Fond du Lac, Wis., sales have increased more than thirty per cent in the last eight months and factory production is 20,000 tire casings monthly, of which one half are cords. About 180 men are employed, with a payroll of more than $30,000 a month. The new non-skid tire originated by the company is popular and selling well.

GOODYEAR 1922 *SALES* $120,000,000

Goodyear sales for the year will reach between $115,000,000 and $120,000,000, it was announced recently by company officials. Sales for the last ten months of 1921 totaled $82,195,000, officials anounced in comparing past year's records. Ratio of current assets to liabilities of approximately 10½ to 1 will be maintained, if not improved, officials said.

Seiberling Anniversary

The Seiberling Tire & Rubber Co. Barberton, Ohio, celebrated its first anniversary on Nov. 16. It is estimated that the end of the year will show gross sales of more than $4,000,000. F. A. Seiberling is president, C. A. Seiberling vice president and I. R. Bailey sales manager with a field sales force of sixty and sixteen distributing agents. The company has about 2,900 dealers handling its products.

Surety Tire Plant Sold

The plant of the Surety Tire & Rubber Co., 2200 Kienlen avenue, St. Louis, Mo., has been sold to a reorganization committee for $100 and assumption of secured claims amounting to $125,000. Claims against the estate in addition total $225,000. The assets have been converted into cash, leaving $50,000 to pay unsecured claims. E. O. Wheeler, attorney, W. L. Burgess, former president, and R. W. Gilbert, former auditor, are working on the reorganization.

$15,022 Verdict for Victor

A jury in the United States District Court on Nov. 24 awarded a verdict of $15,022 to the Victor Rubber Co., of Springfield, O., in its suit for breach of contract against the Grow Tire Co. of Boston. The rubber company sued to recover $16,809.

American Buys Phoenix Plant

American Rubber and Tire Co., Akron, has purchased the factory buildings formerly occupied by the Phoenix Rubber Co. No announcement has been made as to the plans. The Phoenix plant has been idle for several months, due to financial conditions.

Rauschenberger Builds

Officials of the Rauschenberger Tire Co., Akron, announced this week that work on their new factory at Granville, Wis., will be started at once. The factory will require 250 employes when it is in full swing, according to plans of the factory officials.

Batavia Plant Brings $110,000

The plant of the Batavia Rubber Co., Batavia, N. Y., offered at public auction Nov. 9, was sold to two of the creditors, Taylor, Armitage & Eagles Co., mill owners and manufacturers of cotton fabrics, of New York City, and Fred Stern & Co., crude rubber dealers, also of New York. The plant sold for $58,000; the personal property for $10,000; and three mortgages amounted to $42,400, making the total purchase price $110,000. The bid and terms must be confirmed by the federal district court in Buffalo. The plant will continue in operation.

German Co. Pays 30 Per Cent

The Vereinigte Gummiwarenfabriken Harburg-Wien reports gross profits of 132,179,869 marks for the past year. The previous report stated that profits were 45,552,760 marks. A dividend of 30 per cent will be distributed. The Hannoversche Gummiwerke Excelsior, Aktien-Gesellschaft Hannover-Limmer intends to double its capital, thereby bringing it to 100,000,000 marks. In April, 1922, the firm increased its capital from 20,000,000 to 50,000,000 marks after it had raised its capital from 10,000,000 to 20,000,000 marks in November, 1921.

New Rubber-Handled Tools

Pliers and screwdrivers with rubber insulated handles are being manufactured by the Rubber Insulated Metals Corp., 50 Church street, New York City, under the trade name "Rimco." The handles are semi-soft to insure comfort, a firm grip, and less wear and tear on rubber gloves. Molded on to the steel handle by a special process, the rubber is said to form a permanent chemical union with the metal. Electricians, linemen, automobile owners, and others who have occasion to use metal tools where electric current is present are finding these appliances useful and free from danger.

Elgin in Bankruptcy

Creditors have filed an involuntary petition in bankruptcy against the Elgin Rubber Ace Co., Elgin, Ill. Thomas J. Hoban, a local attorney, was appointed receiver. A statement of assets and liabilities will be furnished later.

"J. D." Health Heel

"J. D." is the name of a new rubber heel designed to balance the feet properly according to orthopedic standards. It has a raised surface one-eighth inch higher on the outside of the heel than on the inside. The Counterbalance Rubber Heel Co., Elyria, Ohio, is the manufacturer and district managers are being appointed in all parts of the country to push sales distribution. John Demirjian, the inventor, is president and general manager; T. T. Elliott, formerly with Mason, is vice president and sales manager; Carl Filmore, secretary and treasurer.

MARKETS

Cottons and Fabrics

NEW YORK, DECEMBER, 1922

COTTON prices had alternating advances and declines during the two-weeks period with a net result that was negative as to the future of the market. There was evidence of a division of opinion around the 26 cent level which brought uncertainty and hesitation and which is true of the market at the present writing.

Revised estimates as to the yield of the 1922 crop are not very encouraging. The report of the American Cotton Association figures the yield as low as 9,615,000 bales. Allowing 447,000 bales for linters this would give a total supply of 10,062,000 bales and adding the old crop carry over of 4,900,000 bales we have a total of only 14,966,000 bales. Consumption in America will be about 6,400,000 bales and foreign consumption of American cotton about 5,930,000 bales making a total of 12,330,000 bales. This would leave a carry over of only 2,636,000 bales.

Exports of cotton during October were more than double the amount in September which is especially interesting in view of the present market situation. The shipments amounted to 874,000 bales as against 368,000 bales in September. It should be noted however that shipments are not equal to those of October 1921 and it is also interesting to note that on account of the advance in cotton prices the value of the October shipments was greater than a year ago.

The latest reports show that the cotton spinning industry was more active in October than in September, the aggregate number of active spindle hours reported for the month having been 8,289,885,446 compared with 7,760,863,470 in September. The average number of spindles operated was 36,834,931 at 99.2 per cent capacity compared with 34,822,378 or a 93 per cent capacity in September.

Cotton prices as of December 2 on the New York Cotton Exchange follow:

	Open.	High.	Low.	Close.	Previous Day.
Dec.	24.96	25.05	24.90	24.99	25.08
Jan.	25.00	25.10	24.92	24.99@25.01	25.06
March	24.99	25.17	24.97	25.05	25.10
May	24.90	25.05	24.87	24.93@24.95	24.97
July	24.56	24.73	24.55	24.61@24.65	24.64
Oct.	22.98	23.12	22.95	23.00	23.00

EXTRA STAPLE COTTON

Business in the extra staple cotton market was confined chiefly to middling grade with most of the demand for spots. There was little call for good middling and strict middling with the result that middling commanded within a cent of strict middling prices. The following prices on strict middling in to grade and color were quoted on November 2: 1⅛ inch, 31 to 32½ cents; 1 3/16 inch, 33 to 34 cents; 1¼ inch, 34½ to 36 cents; 1 5/16 inch, 36½ cents upward. Egyptian uppers, medium, 30½ to 32 cents; Peruvian mitafifi, 31 to 32½ cents; medium grade Saks, 35 to 36 cents; high grade Saks, 39 cents upward.

Pimas continues in good demand and there is very little of the No. 3 and No. 4 to be had. No. 2 brought 37 cents and No. 1 is available at 38 to 39 cents.

EGYPTIAN COTTON

The final estimate of cotton production in Egypt for 1922 is placed at 830,000 bales of 478 pounds net. The official estimate for 1921 was 684,000 bales. The area planted this year is estimated at 1,521,000 acres against 1,339,000 last year.

TIRE FABRICS

Large fabric commitments were made by the larger tire manufacturers during the last two months but they are not believed to have covered for their normal requirements and the mills expect the trade to come into the market again soon after the first of the year. The market is strong and prices very firm.

COTTON EXPORTS FROM ALEXANDRIA

Dated Alexandria, November 3, 1922

	Receipts Alexandria Cantars	Exports in Bales to England	Exports in Bales to Continent	Exports in Bales to America	Total Exports Cantars	Stock Alexandria Cantars
This week	386,519	11,297	4,552	4,049	151,022	2,295,028
Same week 1921	212,166	6,709	2,043	5,000	89,023	2,262,407
" " 1920	183,080	6,937	5,846	1,275	105,915	963,525
Since 9/1/1922	1,913,480	60,756	41,767	22,212	950,452	—
Same time 1921	1,635,675	73,317	45,989	39,433	1,208,268	—
" " 1920	961,878	30,896	17,930	5,079	396,555	—

CORD FABRICS

Combed Sakellarides	.78	@	.80
Carded Sakellarides lb.	.71	@	.73
Combed Peeler lb.	.66	@	.68
Carded Peeler lb.	.60	@	.65
Combed Egyptian uppers lb.	.72	@	.76
Carded Egyptian uppers lb.	.65	@	.70

SQUARE WOVEN

17¼-ounce Egyptian uppers, combed lb.	.69	@	.73
17¼-ounce Egyptian uppers, carded lb.	.62	@	.67
17¼-ounce Sakellarides, combed lb.	.74	@	.76
17¼-ounce Sakellarides, carded lb.	.67	@	.69
17¼-ounce Peeler, combed lb.	.63	@	.65
17¼-ounce Peeler, carded lb.	.56	@	.60

Sheetings—The market was quiet with very little interest reported. Prices were practically the same as recorded at the close of the last period: 13½ cents for 40 inch, 3.60; 15 to 15¼ for 40 inch, 2.85 and 11 asked for 4.25.

Ducks—Business was reported on hose and belting lines carrying into June 1923 at from 46 to 47 cents a pound. The market for all items was very firm and many mills are sold ahead far into next year. Single filling is quoted at 20½ to 22 cents a pound, price varying according to the grade; double filling, 22½ to 24 cents. Enameling brings 48 to 50 cents a pound in first hands depending on width and make.

Burlaps—The underlying strength in all jute product markets had its effect on burlaps. There was a heavy demand from domestic bag manufacturers and prices advanced sharply. For 10½ ounce 40 inch, 8.65 to 8.85 was quoted and 10 ounce, 40 inch called for 8.60 to 8.70.

SHEETINGS

40-inch 2.50-yard yd.	.18	@	—
40-inch 2.85-yard yd.	.15	@	.15¼
40-inch 3.15-yard yd.	.15¼	@	.15½
40-inch 3.60-yard yd.	.13½	@	—
40-inch 3.75-yard yd.	.12	@	—
40-inch 4.25-yard yd.	.11	@	—

DUCKS

Belting lb.	.46	@	.47
Hose lb.	.46	@	.47
Enameling lb.	.48	@	.50
Shoe Ducks lb.	.53	@	—
Single filling lb.	.20½	@	.22
Double filling lb.	.22½	@	.24

BURLAPS
(Carload Lots)

8 -ounce 40-inch	7.00	@	7.25
7½-ounce 40-inch	6.80	@	6.95
10 -ounce 40-inch	8.60	@	8.70
10½-ounce 40-inch	8.65	@	8.85

DRILLS

37-inch 3.25-yard yd.	.14	@	—
37-inch 2.75-yard yd.	.15¾	@	—
37-inch 3.00-yard yd.	.14¾	@	—
37-inch 3.50-yard yd.	.13½	@	—
37-inch 3.95-yard yd.	.12½	@	—

OSNABURGS

30-inch 7-ounce	.17¼	@	—
40-inch 7-ounce	.17¼	@	—

Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET—NEW YORK, DECEMBER 3, 1922—Producers of industrial chemicals were well satisfied with the course of the market during the last period. Following the holiday there was a fairly active market and the volume of spot trading was materially better than it had been for the previous week. Contracts are now being negotiated for some items to cover the early months of 1923 and in some instances for periods of six and nine months ahead. Sellers however are not over anxious to contract far ahead on many items. A quiet period toward the end of the month and the close of the year is very likely to follow.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .95 @	—
Aniline oil, bulk basis,	lb.	.16 @	.17
Excellerex,	lb.	.40 @	.45
Formaldehyde-Aniline	lb.	.52½ @	—
Hexamethylene-tetramine	lb.	.95 @	.97½
Paraphenylenediamine	lb.	1.50 @	1.55
Thiocarbanilide, kegs	lb.	.29 @	.31
Vulcocene	lb.	.35 @	—

Inorganic

Lead, dry red bbls.	lb.	.09 @	.09¼
Lead, white, basic carbonate	lb.	.07¼ @	.08
Litharge, domestic	lb.	.09⅝ @	—
imported	lb.	.17 @	—
Lime, Superfine	lb.	.02 @	.02½
Magnesia, calcined, light,	lb.	.22 @	.24
extra light	lb.	.45 @	—
heavy	lb.	.05 @	.05½
Orange Mineral	lb.	.13¼ @	.14¼

COLORS

Blacks

Carbon Black	lb.	.16 @	.20
Micronex	lb.	.17 @	.24
Lamp Black	lb.	.12 @	.40
Bone "	lb.	.05½ @	.07½
Drop "	lb.	.07½ @	.16
Ivory "	lb.	.15 @	.45

Blues

Prussian	lb.	.55 @	.60
Ultramarine	lb.	.10 @	.35
Cobalt	lb.	.21 @	.26

Browns

Iron oxide	lb.	.05 @	.06
Sienna, Italian,	lb.	.05½ @	—
Umber, Turkey,	lb.	.04 @	.05
Vandyke, domestic		.03½ @	.04½

Greens

Chrome, light	lb.	.30 @	.32
medium	lb.	.35 @	.36
dark	lb.	.36 @	.45
commercial	lb.	.12 @	—

Reds

Antimony, crimson	lb.	.40 @	.42
golden	lb.	.21 @	—
red sulphuret	lb.	.20 @	.22
Indian, English, pure	lb.	.12 @	.15
Para toner	cwt.	1.00 @	1.10
Toluidine toner	lb.	2.10 @	—
Venetian red	lb.	.03½ @	.06
Vermillion, quicksilver, English	lb.	1.25 @	1.35
domestic	lb.	.25 @	.30

Whites

Albalith	lb.	.06 @	.06½
Aluminum bronze	lb.	.55 @	.60
Azolith	lb.	.06 @	.06½
Lithopone, domestic (factory)	lb.	.06 @	.06½
Zinc oxide. American Horse Head Special	lb.	.07½ @	.08
XX red	lb.	.07 @	.07½
American Azo: ZZZ (lead free)	lb.	.07 @	.07½
ZZ (under 5 per cent leaded)	lb.	.06¼ @	.06¾
Z (8-10 per cent leaded)		.06 @	.06¼
Zinc oxide, French process, White seal	lb.	.11 @	.11¼
Green seal	lb.	.10 @	.10¼
Red seal	lb.	.09¼ @	.10

Yellows

Chrome, light	lb.	.17 @	—
dark	lb.	.17 @	—
medium	lb.	.17 @	—
Ocher, French	lb.	.02⅜ @	.03½
domestic	lb.	.02½ @	.03

COMPOUNDING INGREDIENTS

Aluminum flake	ton	22.50 @	30.00
hydrate	lb.	.16 @	.18
Ammonia carbonate,	lb.	.09½ @	.10¼
Barium carbonate	ton	75.00 @	80.00
Barium Dust	lb.	.04½ @	—
Barytes, southern off-color,	ton	15.00 @	20.00
Western, prime white,	ton	26.00 @	—
Basofor	lb.	.04¾ @	—
Blanc fixe, dry, f.o.b. works	lb.	.04¼ @	.04½
Carrara filler	lb.	.01½ @	—
Chalk, precipitated, extra light	lb.	.03½ @	.04¼
heavy	lb.	.02½ @	.03¼
Clay, China, domestic,	ton	15.00 @	16.50
imported	ton	16.25 @	23.25
Dixie	ton	22.00 @	32.00
Blue Ridge	ton	22.00 @	32.00
Fossil flour	ton	60.00 @	—
Glues, extra white	lb.	.30 @	.40
medium white	lb.	.20 @	.26
cabinet	lb.	.18 @	.30
cabinet low grade	lb.	.15 @	.18
common bone	lb.	.08½ @	.14
Graphite flake, bbls.	lb.	.05 @	.08
amorphous	lb.	.04 @	.10
Infusorial earth, powdered	ton	60.00 @	—
bolted	ton	65.00 @	—
Liquid rubber	lb.	.15 @	—
Mica, powdered	lb.	.15 @	—
Rotton Stone (powdered)	lb.	.02½ @	.04½
Silica (gold bond)	ton	31.00 @	—
Soapstone, powdered	ton	12.00 @	15.00
Starch, powdered	cwt.	2.80 @	2.90
Talc, domestic	ton	15.00 @	18.00
French	ton	25.00 @	32.50
French, high grade	ton	43.00 @	48.00
Italian	ton	47.00 @	58.00
Terra Alba	cwt.	1.85 @	2.00
Tripoli, white	lb.	.02½ @	—
Whiting, commercial	cwt.	1.00 @	1.10
Quaker	ton	13.00 @	15.00
English cliffstone	cwt.	1.75 @	2.00
gilder's bolted	cwt.	1.15 @	1.25
Paris white American	cwt.	1.25 @	1.35
Wood pulp XXX	ton	32.00 @	—
" " X	ton	25.00 @	—
Zinc Oxide— 5 per cent leaded		.06½ @	.06¾
10 per cent lead sulphate	lb.	.06¼ @	.06½
20 per cent lead sulphate	lb.	.06¼ @	.06½
35 per cent lead sulphate	lb.	.06¼ @	.06½

(Also see whites)

MINERAL RUBBER

Gilsonite	ton	65.00 @	—
Genasco (factory)	ton	60.00 @	—
Hard hydrocarbon	ton	32.00 @	42.00
Soft hydrocarbon	ton	30.00 @	35.00
Pioneer M.R.	ton	42.00 @	44.00
320/340 M. P. hydrocarbon (c. l. factory)	ton	40.00 @	50.00
300/310 M. P. hydrocarbon (c. l. factory)	ton	35.00 @	45.00
Synpro, granulated, M. R. (factory)	ton	54.00 @	69.00

SOFTENERS

Acids

Acetic, 28 per cent	cwt.	2.92 @	3.65
Cresylic, 97 p. c.	gal.	.60 @	.62
95 p. c.	lb.	.55 @	.57
Muriatic, 20 degrees	cwt.	1.00 @	1.10
Nitric, 36 degrees	cwt.	4.50 @	5.00
Sulphuric, 66 degrees	ton	14.00 @	16.00
60 degrees	ton	8.00 @	10.00
Tartaric, crystals	lb.	.32 @	—

Alkalies

Caustic soda, 76 p.c.	cwt.	3.45 @	3.75
Soda ash, 58 p.c.	cwt.	1.95 @	2.30

Oils

Castor, No. 3, bbls.	lb.	.12 @	—
Corn, crude, bbls.	lb.	.10 @	—
refined	lb.	.11½ @	—
Chinawood, bbls.	lb.	.12¾ @	.13
Cottonseed,	lb.	.10¼ @	.10¾
Glycerine, drums	lb.	.18½ @	.19
Linseed, domestic	gal.	.87 @	.90
imported	gal.	.86 @	—
Palm, Niger		.07 @	.07
Lagos	lb.	.07¼ @	.07⅝
Peanut, domestic, crude	lb.	.12 @	—
Petrolatum, amber	lb.	.04½ @	.04¼
dark amber	lb.	.03⅝ @	.03⅞
Pine, steam distilled	gal.	.82 @	.85
Rapeseed, refined	gal.	.78 @	.81
blown	gal.	.92 @	.95
Rosin, first rectified	gal.	.45 @	—
second rectified	gal.	.47 @	—
Tar, commercial	gal.	.31½ @	—
Soya Bean		.11½ @	—
Petrolatum, standard	lb.	.05 @	.08

Resins and Pitches

Cumar resin, hard	lb.	.09 @	.10
soft	lb.	.09 @	.10
Tar Retort	bbl.	11.00 @	—
kiln burned	bbl.	12.50 @	—
Pitch, Burgundy	lb.	.05 @	—
coal tar	ton	.01½ @	—
pine tar		.03½ @	—
Rosin, grade K	bbl.	6.60 @	—
Shellac, fine orange	lb.	.90 @	—

Solvents

Acetone, drums	lb.	.20 @	.23
Alcohol, denatured, No. 1 bbls.	gal.	.34 @	.38
Benzol, 90 per cent	gal.	.27 @	.32
pure	gal.	.30 @	.35
Carbon bisulphide,	lb.	.06½ @	.07½
tetrachloride	lb.	.10½ @	.11½
Dimethylaniline	lb.	.36 @	.38
Motor gasoline, steel bbls.	gal.	.24 @	—
Naptha, V. M. & P.	gal.	.23 @	—
Toluol, pure	gal.	.30 @	.35
Turpentine, spirits	gal.	1.60 @	—
wood	gal.	1.50 @	—

Waxes

Beeswax	lb.	.45 @	—
Carnauba, No. 1	lb.	.20 @	—
Ceresin, white	lb.	.12 @	—
Bayberry	lb.	.20 @	.24
Montan, crude	lb.	.03¼ @	.03¾
Ozokerite, black	lb.	.18 @	—
green	lb.	.25 @	.26
Paraffine	lb.	.02¾ @	.04
Sweet wax	lb.	.12 @	—

SUBSTITUTES

Black	lb.	.07 @	.14
White	lb.	.08 @	.16
Brown	lb.	.10 @	.15
Brown factice	lb.	.07 @	.15
White factice	lb.	.08½ @	.15

VULCANIZING INGREDIENTS

Black hyposulphite	lb.	.25 @	.35
Sulphur chloride (jugs)	lb.	.13½ @	.15
" " (drums)	lb.	.08 @	.10
Sulphur flour (bbls.)	cwt.	2.60 @	3.15
(bags)	cwt.	2.35 @	2.90
100 per cent pure (superfine)	cwt.	2.60 @	3.15
Sulphur, 100 per cent pure, Bergenport brand (bags)	cwt.	2.30 @	2.65
(bbls.)	cwt.	2.55 @	2.90

Zinc Oxide—Leaded zincs continue at the lowered prices made last spring and the French process zincs are at the same prices that have maintained all through the year. Tire manufacturers are heavy purchasers and the demand from this industry promises to continue well into next year. Quotations follow: French process, red seal; barrels, car lots, 9¼ cents per pound; green seal, barrels, car lots, 10 cents; white seal, barrels, car lots, 11 cents; American process, lead free, barrels, car lots, 7½ cents per pound; 10 to 35 per cent lead sulphate barrels, car lots, 6¼ cents per pound.

Barytes—The price of barytes has been advanced from $23 to $26 per ton f. o. b. point of production, package included. This advance has been expected for some time and the increased cost of crude barytes as a result of the duty of $4 a ton upon imported under the new tarriff law, is given as the reason. There is no change in the price of Southern off colored barytes which continues to be quoted at $15 to $20 a ton.

Lithophone—The demand has been good all season and promises to continue so for some time to come. No advance has been made in prices although there continues to be a difference in quotations made by different producers. Quotations follow: bags, car lots, 6 to 6¼ cents, barrels, car lots, 6 to 6½ cents; barrels less than car lots, 6¼ to 6¾ cents.

Blanc Fixe—Consumption is good for the season and prices remain unchanged at 4¼ to 4½ cents a pound for dry and $40 to $50 a ton for pulp.

Litharge—The tire companies have been buying quite freely and the market shows considerable improvement. There was no change in quotations during the fortnight and prices continue as follows: Casks, 9.65 cents; kegs, less than 500 pounds, 13.25 cents; 500 to 2,000 pounds, 11.92 cents; 2,000 to 10,000 pounds, 11.44 cents; 10,000 to 30,000 pounds, 11.03 cents.

Soda Ash—The market was strong with a demand that kept producers busy. No advance was made in price and dealers continue to quote $1.95 to $2.30 for barrels.

Caustic Soda—Business during the period was the greatest in the history of the industry and producers are not anxious to take contracts beyond the first half of 1923. Spot goods continued to be quoted at 3.45 to 3.75.

Aniline Oil—Supplies are none too plentiful and the market holds very firm. Prices still ruled at 16 to 17 cents per pound.

Palm Oil—Offerings were generally light and otherwise there was no change in the situation, Lagos being quoted at 7¼ and Niger 7 cents per pound.

Orange Mineral—The season's business has been very satisfactory and the demand continues to improve. Domestic is quoted at 13.15 to 14¼ cents a pound; English, 13¾ cents, German 14 cents and French, 15 cents.

Crude Rubber

NEW YORK, DEC. 2, 1922

N THE RUBBER AGE of Oct. 25 last we stated that the price of crude rubber might go to 30 cents or higher before much reaction would set in and we gave the opinion of one of the leading American importers of the plantation product to substantiate our statement. The course of the New York market since that report was published has amply justified our prediction. Today ribbed smoked sheets and first latex are quoted at 27⅝ to 27¾ cents, with active buying at these prices, and the rising tendency is so marked that before long spot rubber will reach or even exceed 30 cents.

Yesterday's London cable reported that market exceedingly strong, 14⅜ pence being paid by buyers for the best plantation crepe in active dealings. It would not be surprising to see spot rubber quoted in London very soon at 17 to 18 pence.

While the operations of the Stevenson restriction-of-production plan and the imposition of government export duties are directly responsible for this steady rise in raw rubber, practically all grades sharing in the advance, it must not be forgotten that shortly before this plan was adopted there was a perceptible "lift" to the market. In other words, there would probably have been an increase, gradual no doubt, without any restriction plan in force. After all, any artificial stimulation of prices and enhancement of plantation profits is but a temporary measure which, however, will serve three important purposes before it is finally withdrawn: 1, it will reduce warehouse stocks of crude rubber everywhere to normal figures, or clean out the warehouses entirely; 2, it will rehabilitate those rubber plantations which had become almost bankrupt because the low market prices allowed the average estate little or no margin of profit; 3, it will produce greatly needed revenues in the Far Eastern states and perhaps a portion of the export duties will be turned over to the rubber industry for research and development work.

Quotations as of this date are practically as follows:

Plantations			
Ribbed Smoked Sheets	.27⅝	@	.27¾
First Latex, spot	.27⅝	@	.27¾
December	.27⅝	@	.27¾
January/March	.28½	@	—
April, May, June	.29	@	—
July/December	.30½	@	—
Amber Crepe No. 1, spot	.27¾	@	—
Amber Crepe No. 2, spot	.27	@	—
Amber Crepe No. 3, spot	.26¾	@	—
Light Clean Thin Brown Crepe	.26¾	@	—
Commercially Clean Thin Brown Crepe	.26¼	@	.26½
Specky Brown Crepe	.26	@	—
Roll Brown Crepe, spot	.26	@	—
Paras			
Madeira Fine	.26½	@	.26¾
Acre Fine	.25¾	@	—
Up-river Fine	.25¼	@	—
Up-river Medium	.23½	@	—
Up-river Caucho Ball (shipment)	.20½	@	—
Up-river Coarse	.18½	@	—
Islands Fine	.23½	@	—
Islands Medium	.21½	@	—
Islands Coarse	.17	@	—
Cameta	.17	@	—
Xingu Ball	.17½	@	—
Tapajos Fine	.23	@	—
Pontianac			
Prime Pressed	.18	@	—
Plantation	.09	@	—
Bangermassin	.10	@	—
Siak Gutta Percha	.19	@	—
Prime Macassar	2.80	@	—
Balata			
Panama Block	.45	@	.50
Surinam Sheets	.70	@	—
Columbia Block	.50	@	.52
Venezuela Block	.62	@	—

Reclaimed Rubber

NEW YORK, Dec. 2, 1922

As crude rubber advances in price this market takes on more and more activity. The demand today for reclaimed rubber of all grades is the greatest known in many months. Prices remain firm to strong.

Quotations of this date are nominally as follows:

Standard Reclaims			
Floating	.13¼	@	.14
Friction	.13½	@	.14
Boots and Shoes	.10½	@	.11
Boots and Shoes (washed)	.13¼	@	.13¾
Mechanical	.08	@	.10
Hose	.10	@	.11
Tires, truck	.09	@	.10
Tires, auto	.09½	@	.10
White	.12	@	.13

Scrap Rubber

NEW YORK, Dec. 2, 1922

The scrap rubber market, in view of the advancing tendency of the crude rubber market, is decidedly firm and holding up better than it has for months past. It has veered around to become a sellers' market and dealers are holding tight in anticipation of still higher prices for all grades of scrap. There has been a considerable rise in a number of the grades, notably tire casings and tubes and certain kinds of footwear. Buyers are quite active.

Quotations of this date are as follows:

Auto tire peelings	.01	@	—
Standard White auto ton	20.00	@	22.00
Mixed auto ton	12.00	@	14.00
Bicycle tires	.00½	@	.00⅝
Clean solid truck tires	.01¼	@	.01⅜
Boots and shoes	.03⅜	@	.03⅝
Arctics, trimmed	.02½	@	.02¾
Arctics, untrimmed	.02	@	.02¼
Inner tubes, No. 1	.04	@	.04⅛
Inner tubes, compounded	.03	@	.03¼
Inner tubes, red	.02⅞	@	.03⅛
Battery jars, clean hard rubber	.00¾	@	.01
Heels and pads	Nominal		
Black mixed	Nominal		
Garden Hose	.00⅜	@	.00½
Air brake hose	.00⅝	@	.00¾
Steam and water hose	.00⅝	@	.00½
Red packing	.00½	@	.00⅝
White mixed rubber	.00¾	@	.01
White druggist sundries	.01	@	.01¼

RUBBER EXCHANGE PLAN

AS a result of the recent revival by D. M. Mason, of the Mason Tire & Rubber Company, of the project to organize a rubber exchange on the lines followed by other trade institutions providing for the stabilizing of prices a meeting of rubber dealers and manufacturers was held recently at the offices of the Rubber Association of America for the purpose of taking preliminary steps toward realizing the long-talked-of plan.

American Rubber Patents

1,433,291 Joseph G. Moomy, Erie, Pa., assignor to Mary H. Moomy, Erie, Pa. Method of Making Rubber Tubes.

1,432,967 Joseph V. Clark, Steubenville, Ohio. Tire-Changing Machine.

1,433,301 Arthur A. Robb, Akron, Ohio, assignor to the B. F. Goodrich Co., New York, N. Y. Cushion Tire.

1,432,901 Harry Raflovich, Buffalo, New York. Tire Mold.

1,433,008 Charles Gilbert Hawley, Chicago, Ill. Pneumatic Tire.

1,433,338 Frederick H. Bommarius and Philip Carollo, New Orleans, La. Sectional Vehicle Tire.

1,433,971 Fred Thomas Roberts, Cleveland, Ohio. Method of and Apparatus for Preventing Air Bubbles in Laminated Rubber Articles.

1,433,625 Earnest E. Julian, Wichita, Kans., assignor of one-half to William T. Smith, Protection, Kans. Tire.

1,434,118 Edward P. Henderson, Daytona, Fla. Resilient Tire.

1,433,683 William C. Geer, Akron, Ohio, assignor to The B. F. Goodrich Co., New York. Method and Apparatus for Vulcanizing Tires.

Trade Marks Applied For

[The following are trade-mark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Marks Company, Barrister Building, Washington, D. C. or Bush Building, 130 West 42 Street, New York, trade-mark specialists. As an additional service feature to its readers this Journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering.]

SAVOLD—No. 119,190. Solomon H. Goldberg, Chicago, Ill. For rubber tires of all kinds.

SPORTOCASIN—No. 163,071. Donald B. Abbott, Auburn, Me. For shoes made of leather, and of leather and rubber combined.

BABE RUTH below portrait of Babe Ruth and word Victor on diamond. No. 157,521. Hirschberg & Co., N. Y. C. For same as above.

OPTIMUS—No. 163,189. Stewart & Holmes Drug Co., Seattle, Wash. For rubber gloves.

INRGARD—No. 149,948. The American Automobile Accessories Company, Cincinnati, Ohio. For tire reinforcements made of fabric and cement.

C W C—No. 133,148. The Hydraulic Steel Company, Cleveland, Ohio. For automobile wheels, rims and clamps.

PLI-LITE—No. 164,108. Hanover Rubber Co., West Hanover, Mass. For rubber heels, rubber soles, and rubber half soles.

SWARTZ BRAND in white letters on black rim and word INTIRE in center. No. 166,323. Swartz Brothers, Chicago, Ill. For rubber cement, rim and gasket cement, liquid puncture repair for bicycle tires, and friction adhesive tape.

MASCOT TIRE and head of goat. No. 153,170. American Wholesale Corporation (Baltimore Bargain House), Baltimore,Md. For automobile rubber tires.

FIRESTONE across picture of stone on black lined disc, with lines emenitating from all sides. No. 118,262. The Firestone Tire and Rubber Company, Akron, Ohio. For tires composed of rubber or rubber and fabric, inner tubes, and accessories, namely hook on boots, lace on boots, flaps, and tire repair air bags, fabric and rubber repair patches, tube patches in sheet and patch form, and reliners; and tire repair gum materials, in sheet form.

ZULU—No. 131,966. The B. F. Goodrich Company, N. Y. C. For hose made of rubber reinforced with fabric.

PICTURE of a Knight. No. 165,617. Blakey's Boot Protectors, Limited, Leeds, England. For pads manufactured from rubber or rubber composition for application to boots and shoes.

PICTURE OF A KNIGHT. No. 165,616. Blakey's Boot Protectors, Limited, Leeds, England. For pads manufactured from rubber or rubber composition for application to boots and shoes.

RUBBER ROAD—No. 164,798. Brown Shoe Company, Inc., St. Louis, Mo. For rubber heels for men's, women's, and children's shoes.

EVERELO—No. 155,796. Frank C. Aiello Corporation, N. Y. C. For shoes of combination of fabric and rubber, fabric and leather and leather and rubber, and gloves of leather and rubber.

New Incorporations

CALIFORNIA

Acme Tire Co., to deal in tires and automobile acessories. $100,000. Incorporators: S. Freeman, H. Sapper and H. C. Reynean. Principal office, Polk Avenue, San Francisco, California.

INDIANA

Commercial Tire Corporation, to manufacture and deal in tires. $75,000. Incorporators: H. H. Bieber, C. P. Squires and M. M. Hathaway—Fort Wayne, Indiana. Principal office, Fort Wayne, Indiana.

MARYLAND

Geo. K. Culp, Inc., to manufacture, sell and generally deal in tires. 11,000 shares of common stock, no par. Incorporators: G. K. Culp and W. De Vore, 55 West 44th street; S. Galoppe, 120 West 31st street—New York City. Principal office, 101 East Fayette street, Baltimore, Maryland.

NEW JERSEY

Hatfield Rubber Works, to manufacture molded rubber goods. $200,000. Incorporators: Andrew L. Hatfield, Hillside, New Jersey; Louis Beller and Abraham Beller, Newark, New Jersey.

Lufbery Co., Inc., to manufacture rubber substitutes. $100,000. Incorporators: P. G. Gruden, 1 West 8th street, Bayonne, New Jersey.

NEW YORK

Reis Rubber Products, Inc., to deal in rubber products. $100,000. Incorporators, Abraham L. Bergman, A. S. Wechsler and E. Tunnin. Attorney, J. I. Berman, 346 Broadway, New York City.

T. A. Maguire & Co., to deal in crude rubber. $50,000. Incorporators: R. J. Scully, J. D. Scott, 24 Broad street, New York City; T. A. Maguire, 290 Broadway, New York City. Attorneys, Humes, Buck and Smith, 24 Broad street, New York City.

Automobile Raincoat Co. $10,000. Incorporators: S. L. Leopold, S. Leopold and D L. Cohen. Attorney, R. Cohen, 280 Broadway, New York City.

Interstate Rubber Co. $20,000. Incorporators: G. and A. Andino. J. E. Conklin, 117 West street, New York City. Attorney, N. Permut, 82 Duane St., New York City. Continental Tire & Tube Co., Inc., to manufacture tires and tubes. $100,000. Incorporators: F. H. Butehorn, 37 Wall street, New York City.

Instant Tire Service Co., to deal in tires and rubber goods. $5,000. D. E. Carson, president; P. E. Waxler, treasurer; R. W. Fleming, secretary. Principal office, 75 Henry Street, Binghamton, New York.

C. & P. Tire Co., Inc., to manufacture and deal in tires. Incorporators: P. S. Potter, 45 College avenue, Poughkeepsie, New York; C. J. Drake and F. S. Quinterro, 45 Market street, Poughkeepsie, New York.

OHIO

The Blackwood Tire & Rubber Co., to deal in tires and rubber products. $5,000. Incorporators: Irwin Greenberg, Edward L. Siegel, B. W. Desberg, Samuel O. Siegel and Philip B. Kleiner. Principal office, Cleveland, Ohio.

Conservite Co., to deal in tires and tubes. Incorporators: H. F. Porter, P. H. Wilkinson, C. A. Hope, W. Eberly and L. A. Pickering. Principal office, Cleveland Ohio.

Lyman Manufacturing Co., to manufacture rubber goods. $1,000. Incorporators: K. and G. Lyman, M. L. Hogan, D. L. Hurlbutt and W. G. Benedict. Principal office, Cleveland, Ohio.

Medina Rubber Co., to manufacture tires and tubes. $25,000. H. C. Keck, president; S. E. Johnson, secretary and treasurer; G. F. High, assistant secretary and treasurer; D. R. Pelton, vice president. Principal office, Medina, Ohio.

TENNESSEE

The General Tire & Rubber Co. of Texas. $20,000. Copy of charter filed for record.

Sponge Balls Not Toys

Imported sponge balls should be assessed as rubber manufactures with duty at ten per cent ad valorem and not as toys paying a thirty-five per cent duty, according to a decision by the general appraisers of the United States Customhouse at New York, in which they sustained the protests of the Pacific Trading Co. of San Francisco and T. Takakuwa & Co., Ltd., of Honolulu.

New Rubber Specialty Co.

S. N. Parker, formerly of Akron, is owner and manager of the Ideal Rubber Co., a new factory at Kent, Ohio, manufacturing rubber aprons and other rubber household specialties. Mr. Parker has had long experience in making articles of this character.

Barr Factory for Sandusky, O.

The Barr Rubber Products Co. of Lorain, Ohio, has purchased the Kroma Color plant at Sandusky and will manufacture there after Jan. 1 various rubber articles including druggists' sundries, toy balloons, and specialties. About 100 men will be employed. Nelt Barr is president.

Firestone-Apsley Wage Dispute

According to a news story in the Boston *Globe,* the entire making room at the Firestone-Apsley plant in Hudson, Mass., stopped work on Nov. 6, affecting the entire works with 800 employees. The gum shoe makers asked for a twenty per cent increase in wages, which was refused with the suggestion by Vice President Brown that a committee of townspeople investigate wages paid for similar work in other rubber factories. A committee of six workers will visit other New England plants to gather information on this point and co-operate with the management in adjusting wages. Mr. Brown said that the employees would be assured of a square deal.

Receiver Sues Subscribers

The receiver of the Andes Tire & Rubber Co., Toledo, Ohio, has brought suit against eighty stock subscribers asking judgment for more than $20,000 in unpaid subscriptions. The plant of the company occupies a site of nineteen acres on the Terminal railroad in East Toledo, but is only partially completed.

Judges in Firestone Contests

Hon. Henry C. Wallace, secretary of agriculture; George Horace Lorimer, editor of *The Saturday Evening Post;* and Dr. John Grier Hibben, president of Princeton University, are the judges named to award the four years' university scholarship offered by Harvey S. Firestone, president of the Firestone Tire & Rubber Co., in connection with the national good roads essay contest. Officials of the Highway Education Board estimate that 250,000 high school pupils participated in the contest. This scholarship is valued at $4,000.

Can You Refuse?

EVERYWHERE you see the ravages of Consumption. There were 1,000,000 cases and 100,000 deaths from this scourge last year. But if all that see these words will help,

It can be stamped out

Buy the Tuberculosis Christmas Seals where you see them sold. (A picture of one is below.) The revenue from these sales is devoted to a great organized campaign against Tuberculosis. This campaign gives the service of doctors and nurses to millions of the stricken. It organizes local associations. It carries on educational work in schools and offices and factories.

You cannot help in a nobler work. Join it. Buy the seals.

Stamp Out Tuberculosis
with Christmas Seals

The National, State, and Local Tuberculosis Associations of the United States